GLEANINGS IN BEE CULTURE
A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS
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STRAY STRAWS FROM DR C. C. MILLER

I USED to tip back a hive and pour feed into the bottom-board, but gave up the plan after careful observation showed many dead bees thrown out next morning. The Victor plan, p. 517, is probably a great improvement, and free from disaster, as the bottom-board is shallow, and the bees can help themselves without leaving the bottom-bar.

I DON'T THINK that Harry Lathrop's testimony, p. 528, shows that winter-passages are unnecessary. Notice that he doesn't say he wintered without such passages, but his testimony dates from "this spring, when I placed the bees on the summer stands." After that time they were not confined to the hive long enough to make the lack of passageways dangerous. [By looking over Mr. Lathrop's article again, I see that your point is well taken—that is, he does not offer any testimony against bee-passages *in winter*.—ED.]

STENOG is rather hard on the man who made a business of killing bumble-bees, page 471. All depends on the point of view. Stenog looks upon the bumble-bee as the useful insect that fertilizes red-clover blossoms and makes possible a crop of clover seed, so feels like calling any man names who kills them. Bro. Ritchey looks upon it as the little beast that stings horses attached to reapers and other implements, making possible runaways that result in the cutting-off of arms and legs, and from that point of view feels justified in waging a war of extermination, just as he would against mice and bedbugs.

J. N. RITCHEY writes: "Last spring, May 10, I sowed sweet clover, and find it in bloom June 25. So you see if it is sown in early spring it will bloom the next season; but if left to reseed itself the last of July or August, it will not bloom the next year." If you mean blossoms appeared June 25 from the sowing of May 10, *1900*, that would make it an annual, and I should suspect there was some mistake. If the sowing was May, 1899, then I should expect it to bloom in 1900. Moreover, I should expect it to bloom in 1900 if growth started *any time* in 1899, even later than August. Always, it starts growth one year and blooms the next.

THE PROPORTION of soiled sections with A. E. White in a good season is not more than ten per cent less, he thinks, than at Medina, p. 530. That sets me to wondering whether there may be some reason for soiled sections different from the reasons that prevail here. No ten per cent are soiled here, and not one per cent would be soiled if the sections were always taken soon enough. The sole cause for soiled clover sections is staying too long on the hives. [There is no doubt that the locality has a good deal to do with the amount of soiled sections. A very slow moderate honey-flow will result in a larger percentage of soiled boxes than where the reverse conditions are at work.—ED.]

DON'T QUARREL with Abbott Clemens about slow work dampening sections, so long as neither takes more than 40 at a time. I don't like to take less than 200 at a time, and prefer 500. [It is not our custom to dampen only 40 sections and then fold and get up from the chair for more. We grab up a handful, dampen them, and set them down. We then pick up another handful, dampen these, and place them alongside of the first lot until we have the required number of sections to be folded, be they 200 or 500; then we set down to fold. Your way of putting 100 or 200 in a row, and then dampening them all at one time, may be quicker, however; but the difference in time in either case would be very small, I suspect.—ED.]

"A GREAT RESTRAINER for swarming is a frame of unsealed larvæ. A comb of *capped* brood is not nearly as good." So I thought, but I'm skeptical now. From the same colony, take a frame of unsealed brood and another of sealed brood, put them in two different hives with their adhering bees, and see which will be deserted first. [I have changed my mind once or twice on this subject. Years ago, when swarms used to leave the hives I

hived them in, father would come out in the apiary and say, "You omitted to put in the frames of brood." "Oh, yes! I did put in the brood;" but he showed me it was *sealed*. A few days afterward I put in unsealed larvæ in one or two colonies, and the bees left just the same. I then concluded that the age of brood had nothing to do with it. Later observations seemed to lead me very gradually to believe that unsealed brood was a good deal more of a restrainer than sealed, hence my advice as given in GLEANINGS.—ED.]

YOU ASK, Mr. Editor, whether I tramp for, or beg for, cotton waste for smoker fuel. There's an Irishman who's been working on the railroad for years, and I've always had a pleasant word with him without knowing why. Now I know why, for he's now flagman at the railroad crossing; and as I drive across he hails me, and tells me where to find a little pile of cotton waste. [It pays to cast our bread on the waters, although we may not know when it will come back. As to the cotton waste, I suspect that tons of it could be had at a very small expense, and I have no doubt our Irish friends would be glad to supply any amount of it for a small consideration. It has served its purpose to the railroad company, and of course the latter has no further use for it.—ED.]

"I SUSPECT it was Willie Atchley who first thought of the scheme of transferring cocoons into small bottom cell-cups," says ye editor, p. 469. Certainly, I supposed all understood that, as Pridgen in his pamphlet distinctly gives him the credit. Then to Pridgen we are indebted for taking up the matter at that point, and, instead of making a single cell at a time, and transferring the cocoon with tweezers, making cells "by the peck," and using a transfer-stick, which quickly sets the cocoon in place and beds it down smoothly into the cell, so the bees think it grew that way. [A. I. R. tells me that you are making a great success in raising cells *a la* Pridgen. I am rather inclined to believe that Mr. Pridgen is the most up-to-date queen-breeder in the United States. He has picked out all the best methods, and improved on them, and virtually made a new system. Yes, he has gone ahead of Doolittle, the Atchleys, and the whole of them.—ED.]

IN MY BARN is what I've been trying to get for years, a ton or so of pure sweet-clover hay. My horses will eat green sweet clover very gingerly, but will come at call out of the pasture and eat the dried sweet-clover hay greedily. They eat off all the finer parts, leaving the coarse stalks. Then I throw these coarse stalks down stairs in the basement, to which the horses have entrance at pleasure from the pasture, and the stalks are mostly eaten up. [A. I. R., who has now returned from your place, has been telling me how your horses, on being given a choice of oats in the manger and sweet clover in the mow, went to the latter and helped themselves. He was not perfectly sure they knew of the oats, but he said they evidently regarded it as "a great snap" to be invited to browse that fine sweet-clover hay. You do not tell us at what age you cut this clover; but I should presume it was before it got much in bloom. When the plants are young and juicy they will give the best hay. If just as good hay can be made after the plants have gone to seed, or, rather, have ceased yielding nectar, then we should consider that quite a point in favor of the bees as well as the horses.—ED.]

SAY, aren't you folks at Medina just a bit "sot" in the matter of cell-cups? or do the bees act differently there? I can't begin to get as many cells accepted with big bottoms and jelly as with cocoons. Then there's the trouble of getting jelly and stirring it up to the right consistency, when with the cocoons each larva has its own jelly just exactly of the right sort. You say you don't like "to slice across a brood-comb, mutilating larvæ of all ages, and young bees." Neither would I. Nor do I that thing. With a queen up to her business, or a litttle management in giving occasionally a fresh comb or one with bees hatching out solid, an inch or two square can be cut out to give you 50 to 200 cocoons, and you can put a patch in place of the piece cut out. There's less labor with the cocoons "in this locality." [If there is any one who is "sot" in the matter of cell-cups it is our queen-breeder Mr. Wardell, and not your humble servant. I have been trying to show him the superiority of the Pridgen method; but when Mr. Wardell produces such fine queen-cells, and in such quantities, by using ordinary drone comb, it is a pretty hard matter to buck against the logic of such facts; and yet I have an inward feeling all the time that, if he understood the Pridgen method as thoroughly, he would do even better.—ED]

A PRETTY WAY that is for you to talk, Mr. Editor, p. 537: "Trot out your glossometer," when you know I haven't any glossometer, just because I never could get you to make one. But I'm not so sure that measuring tongues is as good as measuring the crop stored by different colonies. But I must say that my bees work red clover more than years ago, but not to an alarming extent yet. [Trot out your glossometer—why, what is the matter with that? You were always wanting me to make one, when in fact I did not know how. You made a diagram, but about that time I lost faith in the scheme. But there is a glossometer made by an Englishman that is used at the Michigan Experiment Station at Lansing; and I would say to any who have extra long-tongued bees to send specimens of them to that station, which will, I think, be glad to render a report. But with regard to long-tongued bees, perhaps it may be more feasible to direct our efforts toward *short-tubed red clover*. See Prof. Green's article in the editorial department, this issue. The more I think of it, the more I believe he is on the right track. If we follow both of these—stretching, so to speak, the tongues of the bees and shortening the tubes of the clover, we may be able to arrive at the proper solution of the whole trouble, and that right speedily.—ED]

A FOOTNOTE, p. 522, says, "We have heretofore assumed that larvæ just hatched, or

larvæ not more than 3 days old, was the preferred age; but here is a case where the bees evidently had a preference for the five-day limit." I think you misinterpret, Mr. Editor. The bees took larvæ five days out of the egg, not because they preferred such, but because they had nothing younger. I've no sort of an idea you could get them to start royal cells over larvæ that had been fed more than three days if any thing younger was present; and I don't believe they would of choice take any thing more than *two* days from the egg. [I do not think I misinterpret you, doctor; but perhaps you misinterpret me. Quoting from the footnote under consideration I said, "What surprised me. . . was that the bees should have apparently *waited so long* before starting the *bulk* of the cells." Note the italics which I have added to make the quotation better understood. Now, if the bees preferred an earlier age, why didn't they start the bulk of them at the proper age limit instead of waiting two days *after* the limit? for, according to what you say, the bees were building cells all the time; but they "seemed especially desperate in the matter when the age limit had been passed some two days." And a little further up you speak about two cells that were started with larvæ of the proper age. Now, to reiterate, why didn't the bees start 16 cells at the proper age, instead of only 2? but it appears they waited till 2 days *after* the proper age.—ED.]

ABOUT that stinging business, Mr. Editor, if you'll stop getting mad I'm ready to tell all I know. I know that many a time the dart is so sudden and swift that the first I know about it is the sting. Then sometimes a bee will fumble around time enough so I can kill it before it stings. Sometimes it fumbles awhile, and then seems to change its mind about stinging. Sometimes it fumbles awhile, and I say, "Oh! fool away if you want to, I know you don't really mean to sting," and then the little vixen will up and sting just for spite. But when that lightning dart comes, I'm really on the fence to know whether it can first have time to feel where it stings. For a sufficient consideration I'm ready to believe either way. [There, your experience is exactly my own after all; but I am not "on the fence" as you are. After one has been punched in the eye by a mad hybrid that has suddenly darted from the hive and struck with its sting, feet and all, in a very small fraction of a second, I do not see how any one, much less yourself, could be on the fence, or, rather, be in doubt as to whether the bee *had time to feel* before it stuck in the sting. If you should suddenly, in a fit of anger, hit me in my eye with your fist, I do not think that, when I appeared against you before the court with a charge of assault and battery I would swear that you "felt around" before delivering your blow. "Allee samee," I am not afraid of being hit; for as soon as I can I am going to pay you another visit, for A. I. R. came home all enthused on the subject of bees, and especially Pridgen's method of rearing queens.—ED.]

Torrid days and chilly nights,
Lightning's fl sh and thunder's bang;
Rains and windstorms, clouds and fogs,
Warring, jarring, angry gang.

AMERICAN BEE JOURNAL.

Mr. J. R. Schmidt, of Cincinnati, contributes an interesting article on yellow sweet clover and sweet clover in general. He says:

The honey-producing qualities of the yellow sweet clover can not be excelled if ever equaled by any other plant, excepting the white sweet clover. The following little instance will serve as a good example:

The past early spring and up to the last of May I practiced uncapping sealed honey and spreading brood almost to an extreme, and as a result the hives were crammed full of brood with little or no honey. Then came a spell of very disagreeably cool, rainy weather, with the bees confined to the hives almost entirely for 5 days. At the end of this time all the honey was consumed, and they were actually beginning to starve. The prospects for buying several dollars' worth of granulated sugar were excellent, but on the sixth day the clouds all cleared away, the weather warmed up, and the bees began to work desperately upon a small patch of this yellow clover along a railroad track. As this was the only thing they were working on I thought the sugar had to be bought any how.

But I waited two days longer, trusting to luck that they would at least work upon the profuse bloom of white Dutch clover that was now in bloom; but every bee seemed to make a bee-line for this yellow clover, and it fairly swarmed with them. Late in the afternoon of the second day I took a peek at some queen-cells that I expected to hatch, and you can imagine my surprise on seeing the top part of each comb more or less filled with *new honey*. Now, I know this came from the yellow clover, because it was so black and dirty. I first thought it was stored on top of pollen, but this was the color of the honey, and was caused by the soot and dirt falling on the blossoms from passing trains.

In conclusion Mr. Schmidt says, "Do not spend money on white Dutch clover."

AMERICAN BEE-KEEPER.

New South Wales, Australia, is reported to have received recently a consignment of bumble-bees from New Zealand. They came originally from this country, and were imported as pollinating agents.

Some time ago Col. Viete, of Cuba, was reported as having produced 360,000 tons of honey in one year. This should have been pounds and not tons. The error was too great to be misleading.

BRITISH BEE JOURNAL.

An interesting feature of this journal is a fine view every week of an English apiary. At the Royal show of bees and honey at York, the Prince of Wales and the Duke of York were interested spectators. Mr. Carr laid a section-case containing the queen on the top of a frame hive near at hand, while the driven bees were shown in the hive, and their subjugation and disinclination to sting were demonstrated by the bees being taken up in handfuls. The Duke of York having inquired in

what way the bees were removed from the hands, and, being shown the usual method of jerking them off by a downward shake, the Prince of Wales jocosely observed, "And a very good way too." It would be a rare sight in the United States to see one so high in rank as the Prince taking any interest in such things.

Mr. M. G. Dervishian, of the island of Cyprus, makes a vigorous defense of the Cyprian race of bees, as to their hardiness and good qualities in general. He says the French authorities have pronounced the Cyprians to be "the bee of the future."

In view of what has been said about bringing bees *from* India, one reads with interest what Mr. F. L. Sladen, of Ripplecourt, England, has to say in regard to taking bees from England *to* India. Perhaps nobody living is better prepared to speak on this question than Mr. Sladen, whose travels seem to have been very extensive. He says, "Bees have been sent successfully to India on several occasions, but the conditions do not seem to favor them, and sooner or later they become weak, dwindle, and die. Failure has generally been attributed to the bees' inability to resist the attacks of various birds and insects which prey on them and reduce their numbers faster than they can be maintained by breeding; but probably faulty management has also had a good deal to do with it. The chances of success are greater in the hills than in the plains." Concerning the time of carrying the bees to India, Mr. Sladen says: "In attempting to take a swarm of bees to India there would have to be considered, besides the long and trying journey, the risk of bringing them successfully through the heat of the Red Sea. October is the hottest month in the Red Sea. In a swarm of Himalayan bees I brought home from Darjeeling in February (the coolest month in the Red Sea) the deaths that occurred during the two days after we left Aden amounted to nearly half of the total loss of the three weeks' voyage between Calcutta and Marseilles. On the whole I should recommend one not to attempt to do any thing with English bees in India, but to try the native bees and take out only the hives and appliances as are best got in England." As to the kind of bees that can best be reared in India, Mr. Sladen says: "The only bee at present admitting of cultivation is *Apis mellifica*, variety *Indica*, various races of which occur in the hills and plains, and in Ceylon. It may be known roughly from honey-bees unsuited to cultivation by its medium size. The large bee *A. dorsata* (about ⅝ in. long), and the small bee *A. florea* (about $\frac{5}{16}$ in. long) both of which build their combs *out in the open* from boughs of trees and shrubs or from overhanging ledges of rocks, should be avoided except for experiment." In writing on this subject, Mr. W. Horsfall says: "There should be no difficulty whatever in taking bees from England to India. A better time than October, when the English bee activities are over, the queens having generally ceased laying eggs, could not be."

GENERAL CORRESPONDENCE

RELATIONSHIP OF BEE-LIFE TO AGRICULTURE.

Are Bees Attracted to Flowers by the Color they Possess?

BY F. GREINER.

For the benefit of the readers of GLEANINGS I will give in the following a synopsis of an address delivered before the Australasian Association for the Advancement of Science, by Prof. Albert Gale, on the subject of "Color of Flowers, and its Influence on Bee-life." As far as practical and advisable I will give the professor's own words. Some things may not be new to the readers, but it will help to show them the state of affairs over there.

"As I proceed I think I shall be able to show that bee-life and blossoms are so closely associated that, to interefere injuriously with either, will at the same time injure both. Animal life can not exist without the vegetable kingdom. Some forms of vegetable life *can* exist without the presence of animal life, but others would cease to exist without the presence of some forms of insect life. Nearly all insects aid more or less in fertilizing the vegetable kingdom.

"Pollen is the fertilizing and vitalizing agent in reproducing all classes of vegetables. It is produced in abundance by all flowering plants, both by those of conspicuous and inconspicuous blossoms. *As a rule, inconspicuous flowers are wind-lovers, and those of more gaudy tints are insect-lovers.* It may not be generally understood that there are male and female elements in the vegetable organism just as in the animal organism. Agriculturists and those engaged in vegetable culture do not as a rule know that plants are reproduced on precisely similar lines as animals. Not one out of a thousand has sufficient knowledge of his occupation to understand that there exists a sexuality in plants, and that fertilization is as necessary in plants as in animals. The one great aim of all vegetable and animal life is to reproduce its species. Both sexes in all the higher orders of animal life possess locomotive powers to enable them to come together for procreative purposes. Locomotive powers in plant life are very rare.

"The higher orders of animals are uni sexual; occasionally there are malformations termed hermaphrodites; but in the plant world the higher orders are uni-sexual, bi-sexual, or hermaphrodites — uni sexual when the male and female organs are on separate plants; bi-sexual when male and female organs are in separate flowers but on the same plant; hermaphrodite when the procreative organs are both on the same blossom. Yet, nevertheless,

no true flower is hermaphrodite. To make it clearer, the receptive and distributive organs do not mature at one and the same time in the same flower. From this it will be seen how utterly impossible it is in the great majority of cases for the anther to fertilize its associated stigma.

"In nearly every case the pollen of insect-loving plants is not dry and powdery, as in the case of wind-loving flowers, but is heavy and adhesive. Its adhesive nature prevents it from being blown about by winds, and it becomes necessary for an outside agent to transmit it from the male to the female organs."

Now comes the question, Are bees attracted to blossoms by their color? and are certain bright colors—red, blue, purple, etc., more attractive to them than paler tints, such as white-yellow? This my experience most certainly contradicts, although it has so been stated by high authority. I quote from Sir John Lubbock's work on "Bees, Ants, and Wasps:" "I brought a bee to some honey which I placed on blue paper, and about three feet from it I placed a similar quantity of honey on orange paper."

Why he needed to place a similar quantity I can not tell; and why he should have *brought* a bee instead of allowing one to find it, is a problem I can not solve. "The question now is, 'Was the bee attracted by the color of the paper or by the honey?' Last summer in my garden I had a scarlet dahlia in bloom. When it first flowered there was not a stamen present. No bees ever visited it" (to the professor's knowledge). "The plant was afterward neglected by me, and this neglect caused the stamens to appear and the pollen to mature. With this change in the flower it soon became a foraging-ground for the bees. Why did they not visit the early blooms? Because there was no bee-food present. Why did they visit it after the stamens appeared? The flowers were not nearly so conspicuous as the earlier bloom. But in passing over they saw there was a reward for their labor. Early last spring the white arum lily was in bloom, and its white pollen was eagerly sought for by the bees. At the same time the broad beans were in full flower. These, too, were an attractive foraging-ground for the same insects. A little later the peach-tree burst into flower, with the result that the first named was entirely forsaken, and the latter receiving only an occasional visit. Did the bees go to the peach-blossoms on account of their attractive colors? Not a bit of it. While the peach trees were in flower the willows were just showing their catkins. During the bloom of peach and willow my bees were bringing pollen of the two colors only—creamy-white and orange tint. At the same time were roses, marigolds, arum lilies, and other attractive flowers in bloom, but few bees visited them. The pollen was coming from the peach and the willows. The catkins of the willows are so inconspicuous that a large number of people are ignorant of the fact that they are blossoms; yet they were as attractive to the bees as the gaudy peach.

"During the same spring I visited the botanical gardens. There were then beds of English daisies, pansies, anemones, and the turban ranunculus, in full bloom. Nothing in the garden was more showy than the two

"OH, OH! OCH, OW, OW! PLAGUE TAKE THAT BEE."
See Editorial.

latter, yet not a bee visited them. Near these was a shrub (*Buxus sempervirens*) in which there was a constant hum of bees. What was the cause? Hidden among the dark-green foliage were hundreds of small greenish flowers supplying abundance of food. If color had been the attractive agent, bees would have never discovered their food in the shrub, but would have sought the showy beds of anemones, etc., in vain; they were double, and therefore there was no bee-food. A short time afterward I saw the bougainvilleas aglow with their showy bracts. They could be seen hundreds of yards away. At the same time the pittosporums were in flower, which were most inconspicuous. In the former there were no bees to be seen, notwithstanding their fiery glow, whilst in the latter there was a sound as though a swarm of bees had taken possession of it. Watch a large bed of poppies of mixed colors. No one color is neglected by the bees. Poppies are great pollen producers." (I am obliged to omit a great many more of these observations of the professor, on account of lack of space. They are all in the same line. —F. G.)

"Darwin tells us that it took ages on the other side of the world for flowers to develop, and the bees centuries to adapt themselves to the flowers. The chief honey-yielding plants of this continent are the eucalyptus, pittosporum, and tea-tree families. All these bear whitish flowers. Our introduced fruit-trees and ornamental flowering plants bear brightly colored blooms. In springtime our introduced fruit-trees are conspicuous by the multiplicity of their flowers, and our little native bees as readily find the nectar in them as our introduced bees, and they can not have had ages of experience to guide them. And does it not seem very strange that our hive-bees, upon their introduction here, should have forsaken the bright-colored flowers of the old land that were introduced here at the same time they were? The hive-bee, on its arrival here, after having been educated to the high standard it is said to have attained in the Old World, works upon, not our introduced flowers, red, blue, purple, so much as upon our simple white and yellow ones, so unlike what they ought to have done according to the education they received at our antipodes. Is it not queer that our bees should have gone back in their tastes for color when they crossed over the equatorial line and came to this side of the world?"

With due impartiality I have in the foregoing now made the reader acquainted with the essentials of Prof. Gale's observations and conclusions. I can not deny myself the privilege of making some comments, and also to post the reader on what others have done in a similar line, so he may be in a position to judge for himself. Of course, we are agreed that the honey-bee plays a very important part in agriculture, and I am glad the professor holds this view. In regard to the question, "Are certain colors more sympathetic to bees?" opinions differ. All the observations Prof. G. cites fail to prove that color does not attract bees. He seems to labor under the impression that others had so misconceived the nature of our little industrious friends as to think they would ever stand around admiring the beauty of the flowers. I can assure the professor we *all* have a better conception of the business qualification of our bee. We are well satisfied they do not visit ever so gaudy flowers if those flowers have nothing to offer. To find out whether a certain color is more attractive to the bee than another we must allow the bee to choose between the colors, *and we must adjust all other conditions so as to be exactly alike.* If one blossom, inconspicuous as it may be, hides in the depths of its corolla delicious nectar, that blossom will be visited by the bees. A highly colored flower, but yielding neither pollen nor honey, will receive no attention from bees. What reasonable person would expect any thing else?

The bee has two sets of eyes, one set calculated for long range, the other for short distance. It can, therefore, see. Its antennæ are excellent olfactory organs, and it can probably scent nectar in flowers for a longer or shorter distance. I judge that it does not require much time for a bee to ascertain whether a blossom, even a strange flower, is worth visiting or not.

Dr. Herm. Muller, of Germany, conducted a long series of experiments some 15 years ago, which seem to show that gaudy colors are not preferred by the bee. Light-yellow, white, light-blue, violet, rose, purple, bright-yellow, fiery red—that seems to be the order of their choice. Dr. M. took different-colored plates upon which he placed food, and then he noted the behavior of the bees, spending a great deal of time. Generally but two colors were submitted to choose from. The result was as stated.

An observation he made, which is not exactly in line with our subject, "Influence of color," etc., I will make mention of here, as it is very interesting:

Watching a single bee he found it would get its fill of honey in 2½ minutes. In 3½ minutes it had made the home trip, had unloaded and returned. On the whole it made 70 trips in 7 hours. All bees observed were marked with oil color on the thorax; every other bee a different color. Thus he was enabled to distinguish between the different bees, and to note their individual behavior to the colors and otherwise. The different bees behaved differently in many ways. Finally an average was taken. In this way the conclusions arrived at had some foundation. It would have led too far to give these experiments in detail, and for that reason I have only briefly mentioned them. It will seem to me they prove more than Prof. Gale's observations.

Color exercises a pleasurable sensation upon the human eye, and why not upon the eye of the bee? Prof. G. says, in the beginning of his address, "As a rule, inconspicuous flowers are wind-lovers, and those of gaudy tints are insect-lovers." It would be reasonable to suppose that the color was given these latter flowers so to attract the bees and insects. Of course, that does not yet prove that one color

may have more attraction than another. I leave the reader to draw his conclusion.

Naples, N. Y., June 15.

[I will explain to our readers that we have employed Mr. Greiner to do our reviewing of special bulletins relating to bee-keeping. When I received the bulletin from the Australasian Association, on the color of flowers and its influence on bee-life, I referred it to Mr. Greiner, asking him to give us a boiled-down synopsis of the paper, and this he has done in a most admirable manner. The reader will find much of real value and interest in it.—ED.]

CANDIED VS. LIQUID HONEY AT RETAIL.

A Reply to Dr. Miller, R. C. Aiken, et al.

BY CHALON FOWLS.

Editor Gleanings:—In reply to your query on page 396, I did see Dr. Miller's Straw about Mr. C. F. Muth selling candied honey, but somehow I couldn't swallow that statement, thinking Dr. M. must be mistaken. It looked to me very doubtful or misleading. I have no doubt that he "sold more honey than any other man in the State;" but what part of Mr. Muth's trade did Dr. Miller refer to? If he meant that sold to manufacturers in original packages, mostly barrels, I suppose that was generally candied; but that is not what I am talking about. But if Dr. M. refers to Mr. Muth's bottled honey, put up for the grocer's trade, then my impression is that by far the largest part of it was put up in the liquid form.

In Nov., 1884, I spent over a week in Cincinnati; and as Mr. Muth in his hearty way invited me to make my home with him while there, I did so. I remember one day at dinner that Mrs. Muth spoke of melting up four barrels of honey that morning. He had 700 barrels of honey in his cellar at that time, and his store was literally crammed with comb and extracted honey. Of the latter, nearly all was displayed in the liquid form in the Muth bottles. I well remember there was a pyramid stacked up in front, higher than my head, probably a ton or two, in the Muth bottles, as clear as crystal. Right there is where I got my first points on how to put up honey so as to make it attractive and *sell*. Now, if I were raising butter I would lay all my plans so as to capture the fancy trade and get the *top price*.

In the name of common sense, why should not progressive bee-keepers be as much alive to their interests as progressive farmers? In answer to an inquiry I have the following letter from Mr. C. F. Muth's son:

Mr. Fowls:—My father always sold a good deal of granulated honey to consumers (they were those that you could talk to, and he at all times made it his business to talk it); but when it comes down to business among the trade, then it must be liquid, or there will not be much sold. It is surprising how little the people know of extracted honey; and it takes talk, talk, and only a few understand, or want to understand. If the masses were made to understand that they could buy pure extracted honey at retail at 15 cents, we alone could dispose of many carloads a year to the consumers; but as it is, the real consumer that is looked for is the manufacturer. FRED W. MUTH.

Cincinnati, Ohio, May 15.

It would seem then that Mr. Muth's trade in small packages for family use was built up principally with *liquid* honey. His trade in candied was only with such customers as he could see personally, and this accords with my own experience.

I sell to 60 or 70 retail grocers, but I can only guess how many people buy the honey—perhaps between 1000 and 4000.

Now, as I don't operate a store myself, as Mr. Muth did, you can see that the number of people I could see personally must be small, as I now have no time to peddle, and in addition to my local trade my bottled honey is now handled by some grocers whom I have never seen.

What in the world does Dr. Miller call "good prices"? The price Mr. Muth got from manufacturers? *Rats!* probably 7 or 8 cents by the barrel for the best, and lower for other grades. I have yet to learn of a single producer who sells any large amount of candied honey put up for family use, at any thing like a remunerative price. Can you find a single person who sells exclusively candied honey in that way? If so, trot him out.

But I can imagine that, if this fad obtains favor in the country, it will mean lower prices for us all. I have a letter from a New York State honey-producer and seller of honey in which, after heartily commending my former article, he says, "If Aikin has his way we

J. E. LYON'S METHOD OF WINTERING BEES IN THE VICINITY OF LONGMONT, COL.
See Editorials.

shall be selling honey at 3 cts. in a short while." Tell Dr. Miller that, some years ago, I planted a tree, and I have now climbed it, and am now enjoying the fruit of my labor. When I saw him pelting me with *straw* I just laughed. The fruit is ripe and good up here, and I am not going to come down for straw. Better try a clod.

Oberlin, O., May 23.

[I think we shall have to admit that friend Fowls has the best of the argument. The proof of the pudding is in the eating. He has been getting and is now getting double prices for his honey, because he puts up a first-class article, sees that it is never allowed to candy while on sale (and if it does he replaces it), and puts it up in an attractive form. Friend Fowls, and friend Selser, of Philadelphia, come very near being our best authorities on bottled honey—at least, I believe they know more about the subject than any other two bee-keepers in the country, and they both believe and follow the same method; and yet if either one of them were in Mr. Aikin's locality he might find it more convenient to put out his honey in the candied form, and that the profits would be just as great; or, what is more probable, the people of Colorado would not pay the prices obtained by Mr. Selser and Mr. Fowls for their bottled goods.—ED.]

BISULPHIDE OF CARBON.

Its Use in Destroying Moth-worms in Brood-combs and Comb Honey; how to Apply the Drug; some Misconceptions Corrected; a Valuable Article.

BY C. DAVENPORT.

In GLEANINGS for April 15, Rambler thus tells how Dr. Chase kills moth-worms in brood-combs:

"Set the hives containing the combs in a pile of several in height; place under the bottom hive a few drops of bisulphide of carbon, and it soon accomplishes its mission."

Those who have tried this plan have undoubtedly thought there was a mistake somewhere; for the fact is, used in this way it would not have much more effect than so much water—at least on such moth-worms as inhabit this locality. I have used considerable bisulphide during the last few years, and have done a good deal of experimenting with it; and if used in the right way it will kill the worms and also kill or destroy the vitality of any eggs of the moth-miller which may be in the combs at the time they are treated.

Before describing the method that must necessarily be employed to do this I wish to say a few words about the bisulphide; and I should like to know if there is any one in our ranks who knows much about it—how it is made, and whether there are two kinds of it. The druggist here was able to give me but little information in regard to the matter; but he said he thought there was only one kind; but I think there must be two kinds, or at least two grades of the stuff.

Some time ago I bought quite a quantity of it. This had a powerful, repulsive, sickening odor, and it was very explosive. The druggist cautioned me to be very careful with it, for he said it was very dangerous if fire was brought near it, as the fumes from it, as well as the liquid itself, would explode.

In order to find out just how dangerous it was I experimented with it by putting small quantities in a dish, and using a lighted match on the end of a long stick. Before the flame touched the liquid itself there would be an explosion every time.

Section honey which was exposed to the fumes of it long enough to have moth-worms killed seemed to become thinner, or gather and hold some of this damp fume. In some cases the combs, soon after treatment, would sweat the same as honey that has been kept in a damp cool place will. It also injured the flavor. I explained the matter in detail in GLEANINGS the same season these experiments were made.

This first supply having been used up, last season I purchased more, which seems considerably different from what I had at first. This first supply I got was kept by the druggist in a large tin can which would hold a number of gallons All he had last season was in small tin cans which held only a pound, and it was much more expensive than that which he formerly had. The bisulphide in these small cans, costing 40 cents apiece, though it was nearly if not fully as effective in destroying moth-worms as the first was, the fumes from it do not seem so powerful, neither could I get any to explode. A lighted match dropped into a small quantity would not cause an explosion, though it would set the liquid on fire, which would burn somewhat slowly until all consumed, and it does not appear to injure comb honey as the first did, though my experiments with it in this respect have not been thorough enough so I can say positively that it will not. I would not dispense with its use as a means of destroying moth-worms and eggs in brood-combs, even if it cost three or four dollars a pound; but in order to make its use effective it is necessary that the combs to be treated should be put in a barrel, box, or something of the kind that can be closed up perfectly tight; and instead of sprinkling a small amount of the bisulphide on the inside of whatever is used, quite a quantity of it must be placed inside in an open dish. I use a small glass tumbler. The amount to use does not matter so there is enough; for any that does not evaporate can be poured back in the can for future use, as, no matter how long a quantity of it may have been exposed to the air, any of it which has not evaporated is just as strong as it was before being exposed. It is like chloroform in this respect. The latter I have also used, and found to be effective in destroying worms in brood-combs. But it has no effect on the eggs, and it utterly ruins the flavor of comb honey, giving it a strong rank taste. It is much more expensive for this purpose than the bisulphide, and the combs have to be subjected to its fumes for a much longer time.

When using bisulphide, the length of time necessary to expose the combs to its fumes depends upon how tight the box or whatever is used to treat them in can be closed, and its size—no matter, though, how long brood-combs are exposed to these fumes, it does not injure them in the least; but as a matter of economy merely, one would not desire to treat them for a longer length of time than is necessary, and this is an easy matter to tell; for if, upon lifting out one of the combs, and one dead worm is found, they are all dead, for this stuff shows no favor, but kills all, big or little, alike, and at the same or very nearly the same time. It is entirely different in this respect from the fumes of sulphur, for with sulphur, as those who have used it have probably noticed, the small worms are killed in much less time than the large ones; and if, as my experiments last summer lead me to believe, there is one grade or kind of bisulphide that will not injure section honey, it will be a great boon to bee-keepers in localities where moth-worms are as troublesome as they are here, for, except when they are quite small, it is impossible to kill them in comb honey with the fumes of sulphur unless the combs are treated long enough to become discolored, which, in the case of section honey, may injure or prevent its sale altogether; and after worms reach a certain size, say one inch in length, it is impossible to kill them at all with sulphur unless the combs they are in are treated so long that they become fairly green in color. But for some reason moth-worms develop much more rapidly in brood-combs than they do in section honey. On this account it is not so difficult a matter to keep the latter free of them by the use of sulphur, provided they are treated in time, and often enough so the worms do not reach much size; for when the worms are very small they can be killed by the fumes of sulphur without discoloring the combs in the least; but sulphur has no effect on the moth-eggs, and the great advantage of bisulphide to treat brood-combs is that it kills the eggs also, so only one treatment is necessary if the combs are afterward put where the moth-miller does not have access to them.

It seems to me that The A. I. Root Co. should investigate in regard to whether there is one kind that will not injure comb honey; and if so, keep it in stock so bee-keepers could, when ordering, have a can or two put in with their supplies, as many druggists do not keep it on hand. But possibly the formalin Rambler spoke of might serve us as a moth-worm killer better yet. I was reading in a paper some time ago that it was used at nearly all the large libraries in the United States and Europe as a means of disinfecting books; but the druggist here had never even heard of it, nor was I able to procure any in several large towns in which I was last fall.

Southern Minn.

THE RAUCHFUSS BROS.' TENEMENT HIVE. SEE EDITORIALS.

[In answer to your question I would state that I always supposed there was only one kind of bisulphide of carbon. It may, however, vary in strength and in point of explosiveness; but I should presume that the article first sent out might be more explosive than that now made. The very fact that it is now put up in *small* cans goes to show that its dangerous character is recognized by insurance companies, and it is doubtless the underwriters' rules that specify the use of small cans. The makers of the drug have probably also made an effort to render it less explosive. There was a time when benzine was so explosive that it was hardly deemed advisable to bring it into the house—much less use it in stoves for cooking purposes; but now it has been so carefully refined we have what is at present designated "gasoline," a much safer article to use.

No one has heretofore, I believe, gone as thoroughly into the uses of bisulphide of carbon as you have. As it is a dangerous as well as a valuable drug, to know *just how* to use it is worth not a little.—ED.]

CLEANING UP AFTER EXTRACTING.

Honey from Cappings; how to Treat the Cappings; Honey Vinegar; Making the Wax and Vinegar Pay for the Work in the Apiary; Melting Wax on the Stove.

BY MRS. A. J. BARBER.

After all the combs have been extracted, and while they are being returned to the hives, and the tank is being emptied, the two persons who have been uncapping wash the knives, pails, and other utensils used in the work, and the floor is cleaned by throwing on several pailfuls of water, and sweeping it off. We let the cappings stand until next day. I usually attend to them early in the morning, when they are nicely drained. There are usually two or three pailfuls of honey in the tub under them. The honey is put away, and the cappings washed by pouring a lot of warm water through them several times. The tank, extractor, and strainer-cloth are rinsed out with hot water first, and then with cold, and all rinsings put into the vinegar-barrels with the washings from the cappings. We often have 25 gallons sweet enough to make good vinegar. The cappings are put into a solar wax-extractor, and make fine wax We have never had any thing but a home-made extractor; and as we render up scrapings and old combs—any thing that will make wax, we have some impurities in it. It is all put aside until the honey season is over, and then I take an afternoon for melting it over and cleaning it.

I begin my preparations by putting newspapers on the floor all round the stove; then after getting a good steady coal fire and a big wash-boiler with two pailfuls of water over it I get my cakes of wax on the left-hand side, within easy reach of the stove. On the right hand I put the vessels for the melted wax. I have a bag of cheese-cloth, made about the size of a pillow-slip, and put several cakes of wax into it, and put it into one end of the boiler, having the top of the bag over the end of the boiler, so that it does not get into the wax when it melts. As fast as the wax melts and the water gets to boiling too hard, I put in fresh cakes to keep down the heat. As the wax melts it is dipped off with a tin dipper or cup. I can take care of a lot in an afternoon, and it comes out nice too. When I get all the cakes melted, and the bag is taken out, I dip carefully until there is about half an inch of wax left on the water. I leave that to cool, as there is always a dark sediment on the lower side. This cake is put away until next season, when it is put through a solar extractor again.

This year we are getting a Rauchfuss extractor, and hope to do away with the mussing about the stove, though it is not so bad as I used to think it would be. Last year I prepared 130 pounds in four hours, and had no cleaning up to speak of except to scrub my boiler with dry papers for a good long time. The vinegar is more work, as we make several barrels every year. We try to make the vinegar and wax pay most of the running expenses of the apiary.

Mancos, Colo.

GLEANINGS FROM GLEANINGS.

Tall Against Square Sections, and Plain Sections and Fences.

BY A. J. WRIGHT.

Much discussion has arisen in regard to tall vs. square sections. While some condemn the latter in strong terms, others favor them, and by no means are anxious for a change. I think it was the editor who said that the 4¼ × 4¼ is about as near standard as any thing we can get. Now, I believe in adopting that which is the best when we are *sure* that it *is* the best; but this continual changing is very trying to the nerves as well as to the pocket of the bee-keeper. As for myself, I can see no good reason for changing from the 4¼ × 4¼ to any other size. Some of the reasons given for changing are that the tall sections are handsomer, better filled, and are preferred by customers, bringing a better price, etc. The tall sections—door and window shaped—do not to my eye present as handsome an appearance as the 4¼ × 4¼ square, equal on all sides, without deception. That the bees will fill the tall section better, I am slow to believe. It is urged that the bees build downward faster than sidewise. Now, while it is true that the bees of necessity keep the lower edge of the comb a little in advance of the width, yet in building in a 4¼ × 4¼ space, if there is any thing like a force of bees such as ought to be working in sections they will keep the sides pretty well along with the downward movement; and in the event of their reaching the bottom sooner they will devote their energies to filling out at the sides.

Allow me to digress, and call your attention to p. 569, where Mr. Niver puts this question: "In one hundred cases, how many cases of sections would you expect to find of that kind?" (sealed clear out to the wood or nearly so), and Mr. Root answers, "Perhaps one or two." Why, if my bees didn't do better than that I should feel considerably discouraged. Last season 90 per cent of my section honey in 4¼×4¼ sections were filled clear out to the wood all around, and not a pop-hole—a very poor season too; and this, I believe, was due to the habits of my bees, and also to the plain sections and fence which I have adopted. I do not believe any better showing can be made with the tall sections. Where did this idea of a house-door or window-shaped section come from any way? Did some customer clamor for it? or is it the output of some manufacturer or producer who has some new idea that he wishes the public to adopt? Can a better price be obta ned? If so, is it not for the reason that the customer is deceived into believing that he is getting more honey for his money? and is this deception honorable? Do you believe that the average customer would pay two cents a pound more for the tall section on the basis of its more attractive appearance?

As I have said, I believe in improvement; and when I am satisfied that it is better for me to adopt the tall section I will do so; but I believe it to be an unnecessary and expensive change for bee-keepers to make. I believe with you, Mr. Editor, that the 4¼×4¼ section is about as near standard as any thing we can get.

I said I had adopted the plain sections and fences. The sections are all right. The fences are open to the objection that they are very difficult to clean; and if they are accidentally left out in the wet the glue will soften, and the fence fall apart. The general principle and theory of the fence is all right; but there is yet, I think, quite a field for improvement. I notice there is a tendency among some of the brethren to get a little huffy over the matter of sections. Let us carry on these discussions in a friendly manner. If there is a class of people in the world who ought to be sweet-tempered it is the bee-keepers.

Bradford, N. Y.

[The idea of the house-door comparison to the tall section originated with the most extensive bee-keeper in the world, Capt. J. E. Hetherington. It is the latter, I believe, who has been getting from one to two cents a pound above the market price, for his honey, for a good many years; and I believe he attributes this difference largely to the shape of the section. It was also Capt. Hetherington who, I believe, started the tall section. Fads and improvements are bound to come. Some are good and some are bad. As you say, we should proceed cautiously, and ascertain whether our own locality, as well as the local markets, will warrant the change. With regard to plain sections and fences, the article just following, by S. P. Culley, is something to the point.—ED.]

TRAVEL-STAIN; NON-SWARMING; FENCE SEPARATORS.

A Reply to J. E. Crane and Dr. C. C. Miller.

BY S. P. CULLEY.

In a late issue of GLEANINGS Mr. J. E. Crane takes the writer in hand in an article of some length on "travel-stain" and "non-swarming." We are glad that Mr. Crane was not "squelched" by our former article, as that was furthest from our intention. We both write, we think, to advance the cause of truth.

As to travel-stain, we now, as in our former article, admit that there is pollen-stain, also propolis-stain, and likewise old-cappings stain; but also, as formerly, we claim that there is a saliva-stain. To prove it, take a piece of snow-white section, put pure clear syrup on it, and let the bees lick it off with their tongues; repeat over and over, and you will see the white wood grow yellow and more yellow each time; while if you put some of the same syrup on a similar piece of snow-white section just as often, and wash it off with clean clear water, instead of having the bees lick it off, and note the difference in the way the pieces of white wood are stained, you will be surprised. The ones the bees licked will develop the genuine saliva travel-stain, yellow and deeper yellow, while the other will not have a trace of it. Do those who doubt bees secreting saliva suppose their tongues are run dry, so to speak? that they secrete no lubricant similar to saliva in other animals—synovia, etc.?

In the first article we said this secretion is more copious in a slow than in a fast flow, and Mr. Crane calls this "ingenious adaptation to requirements." Suppose the actual amount of this secretion to be about uniform, it would follow that, during a fast flow, when the bee loads with nectar and unloads often, there would be *proportionately* less of this staining during the fast flow. Also, during a fast flow the combs are more promptly filled, and there is, therefore, less licking by the bees than in a time-consuming slow flow, hence less stain during the fast and more during the slow flow. How does Mr. Crane account for the glossy blackness that once white combs gradually acquire? Is this from pollen?

As to Mr. Crane's charge of "ingenious adaptation to requirements," we do not see that he has as yet made out a case. We are more than willing to co-operate with Mr. C. or others to produce non-swarming bees; but we can not expect success to crown our efforts. Mr. Crane discourages our plan for possibly producing non-swarmers by preventing swarming for generations and generations *of bees* till they forget that method of increase, and says it would take fifty years, and is too slow—that it may be done by selection. As to speed, eight generations of bees can be produced in one season—more than that in the far South. This would be forty generations in five, or eighty generations in ten years. In three, five, eight, and ten years some of the queens could be "turned loose" to do as they please about swarming, and progress noted. A

marked diminution of the swarming impulse at any time observable would be encouraging. This "forgetting" plan is the one (scientific men assure us) by which nature works great changes by evolution. Mr. Crane's plan of selection has also a scientific basis as an aid to the first.

We have no faith in the idea that a strain of bees may be produced in which the honey-gathering instinct shall develop to such an extent as to overshadow and absorb the swarming instinct; because one primary object the bee has in gathering honey is to rear brood, to "multiply, and fill the earth," to "bring forth its kind;" and how increasing its honey-gathering ability or disposition would operate to overshadow or dwarf the disposition to swarm, we can not make out. We should look for no such effect. In our view, as well expect to produce a strain so intent on honey-gathering that they would curtail eating. The honey-gathering ability and disposition should and may be increased; but does this also, of itself, decrease the disposition to swarm? We fear not. Our own observation is all against the idea. We say again, we are ready and willing to co-operate in efforts to produce non-swarming, but it will be a case of works without faith. By the way, can there not be some plan devised to aid in the carrying-out of such protracted and expensive experimental work as an effort to breed out the swarming impulse, as by governmental or State aid, or aid from the National Association? Such work is rather protracted and onerous for individual effort and investment, and the reward is uncertain. Furthermore, an individual might devote years of time, and then through sickness or death all gain, if any, be lost.

We leave to the editor the task of investigating Mr. Crane's fish story—that one about Prof. Loeb producing fish-spawn by chemical means. We are interested in the outcome, however, and hope the editor will use all diligence in ascertaining the exact facts. If this professor can produce fish by purely chemical means, let us urge him to devise a method of producing bees without the use of queens or drones. Then we can produce our bees as we wish, and dispense with swarming on the requeening plan.

In the July or August GLEANINGS, 1899, Dr. Miller told of an experiment he made by filling one half of some supers with plain sections and fences, and the other half with beeway sections and old-fashioned separators, and against the fence separator. The doctor expressed surprise that freer passage should do harm, as he had better finish with the old-fashioned way. In a late issue of the *Progressive Bee keeper* he gives the same experience. We think we can explain that. Dr. Miller's locality had a poor season, little or no flow from white clover, a mysterious slow flow afterward, according to his own testimony in Straws. This unusual season explains the matter, in our opinion. The old-fashioned separators make each section virtually a compartment in itself, while the freer communication of the fence makes one compartment of the whole super. During a slow flow these small compartments will be occupied a few at a time as needed, the solid separators tending to confine the bees till each occupied compartment is properly filled and finished, while the freer communication afforded by the fence (during a slow flow, mind you) causes the bees to occupy more space than the flow justifies — hence poor finish. Did Dr. Miller ever have a colony working nicely in one super, raise it, and add one below, and have the bees abandon both instead of occupying the added one? We have, and it is the same principle of too much room, scattered bees, and dissipated forces, that operated to produce the result of which Dr. M. speaks. We do not regard this as a point against the fence separators and plain sections under usual and normal conditions. With bees to occupy the super, or a good portion of it, and an average flow, the freer communication is a big advantage with most colonies, we think; but *weak* colonies during a *slow* flow will do better-finished work with solid separators, because they concentrate in a part of the compartments instead of spreading out through the super.

Higginsville, Mo., April 25.

[Your explanation regarding the doctor's experience with plain and old-style sections is one that I advanced nearly a year ago, and also at the Colorado convention in November last; and later facts have proven it over and over again, that in a slow or moderate flow, and in the case of a colony not overly strong, the old-style sections with separators would have the advantage; but when there is a good flow, and colonies are *strong*, plain sections with fences will be filled sooner and better. But if there is any advantage in the old-style separators they can be used just as well with plain sections, only the separator would have to be cleated.

With regard to the fish story, that matter has been already covered and answered by Prof. Cook on page 434.

As to the non-swarming idea, in the article just following from the pen of W. W. Somerford, of Cuba, is something which may throw a little light on the matter. Something has already been accomplished as will appear from what he says, although I suspect that the common run of Italians would have shown a marked superiority over the common blacks in Cuba, in just the very respects named; it would not be surprising, therefore, if queens of *selected* stock would develop a progeny that would do exactly what Mr. Somerford's Italians did for him. While I can hardly believe that the breeding-out of the swarming instinct would also breed out good honey-gathering qualities, yet we may have to admit that many times a newly hived swarm will show energy sufficient to gather as much as or more honey than would have been taken from the parent colony and swarm had no natural increase taken place.

In the matter of saliva-stains, I believe you are right; for I have noticed that sections are often stained in the way you speak of. I have also noticed the cappings of honey with the same discoloration. This saliva-stain can be removed by bleaching, *a la* Walker, as I have

before explained. Possibly the pollen-stains and saliva-stains have been confused for one and the same thing.—Ed]

NON-SWARMING BEES.

Have we Succeeded in Getting Them Yet?

BY W. W. SOMERFORD.

I am surprised to see so much in your columns in regard to the "possibility" of producing a non-swarming race of bees, and at the same time have good honey-hustlers. I was of the opinion that that fact had long ago been *settled* by all bee-keepers who had had much experience with bees. The swarming impulse, so far as my experience goes, has about been bred out of the best bees now offered by all our standard queen-breeders.

I had evidence so strong to prove it, since coming here last October, that I will never doubt it again; nor could any one else, situated as I was, having one small apiary of modern bees, from the States, and one apiary of about the same size that had the pure native Cuban black bee that has made Cuba so famous for honey and wax for the last three or four centuries. Those same black or brown bees were robbed at no time more than once or twice a year, while with modern management twelve superfuls a year would have been the result, or more. I put said bees into frame hives, furnished them combs and foundation in plenty, and gave them plenty of room and attention, and should have gotten honey. But I didn't. After the cool weather was over I got only swarms — swarms from sunrise till sundown. I handled them to the best of my ability; but after January I got only swarms, and supers full of brood.

I was using ten-frame hives, and lots of them had brood touching the top-bars in the top stories — no room for honey, and no idea of getting any except enough to feed their brood on—a worthless strain of bees except to store honey in *cool weather* in December and January. While those native bees were cutting such swarming and brood-rearing capers my modern-bred non-swarming bees were filling their supers solid with honey every seven or eight days, and kept on doing it until May, and not a swarm from any of them until the honey-flow slacked off—until they could find nothing to do but swarm; and then only two out of the lot swarmed, and all were booming colonies. All my modern-bred bees did the same thing — hustle in the honey, not swarm to death, as that trait was positively bred out of them years ago—so much so that the question as to the possibility of breeding out swarming is, I consider, a settled one, and I learn from my friend Mr. Howe, Mr. Coggshall's old "lightning operator," that that fact is a part (the greater part too) of Mr. C.'s success. He uses bees that store honey, not swarm according to "nature," as some suggest; and when Mr. C. gets "by buying" a ranch of those natural swarmers, "swarms is all he gets until requeening the outfit."

Caimeto, Cuba.

MANAGING SWARMS HAVING CLIPPED QUEENS.

"Say, Brother Doolittle, I am having trouble with my swarms which have clipped wings, and I came over this afternoon to have a little talk with you about the matter, to see if you can not tell us something more about it than you did in the May 15th number of GLEANINGS."

"Well, Brother Swift, I will do the best I can to help you; but you should always bear in mind that no person can well get all of the minutiæ of any thing into one number of a bee-paper. What seems to be the trouble?"

"In the first place I did not seem to be able to get the bees to alight on the swarm-catcher having the caged queen in it. I held it up in the air in the thickest of the bees, but they paid no attention to it, but went right to clustering on a limb of a tree."

"They will sometimes persist in doing this; and to overcome this part of the matter I sometimes hold the catcher close up in front of the hive where the bees are issuing, so as to catch a pint or so, when the cover is shut over these bees and the caged queen. Now hold it up in the air, as spoken of in a former number of GLEANINGS, and the bees in the catcher, together with those in the cage, will fan their wings, which tells those in the air that they have found the queen and are clustering about her, when, as a rule, with me, the swarm will at once begin to cluster on the swarm-catcher. However, some swarms seem bound to cluster on the limb of a tree; and where this is so, as soon as from one-fourth to one-half have clustered I open the catcher, leaving the caged queen inside, catch what has clustered in the catcher, closing the cover. I now leave the catcher with the bees inside till all of the bees which are outside cluster on it, when they are taken and hived the same as a swarm from a limb."

"But suppose you do not find the queen before the bees have all ceased to leave the hive, how do you then get the bees to tell the others the queen is in the catcher?"

"If the bees all get out before I find the queen, then I allow them to start to cluster, and proceed as before. Or I sometimes hold the catcher in front of the entrance before I find the queen, if I do not see her readily, and, after finding the queen, I slip the cage containing her in with the bees."

"Do you ever have any trouble from the bees not clustering on the limb or on the catcher, but returning while you are trying to get them?"

"Yes, I have had them return without clustering anywhere."

"And did they always go back to their own hive? or did they scatter all about, entering wrong hives and getting killed to the amount of half or more of the swarm?"

"Sometimes they are inclined to enter wrong

hives, especially if the hives stand close together; but with hives standing ten feet apart each way, on the hexagonal plan, as do mine, it is quite a rare thing to have the bees of any swarm try to go into wrong hives."

"Only the other day I had a swarm scatter all about, or spread out all over the whole apiary, instead of clustering, then in a few minutes they commenced to go into half a dozen hives all at once, and nearly all of them were killed. This made me feel very bad, and I almost resolved never to clip another queen. I thought they might better have gone to the woods than to have been killed in this way."

"This *was bad*, and something which I never had happen in all of my 30 years' experience with clipped queens; but, even bad as it was, you had the queen left, which you would not have had where a swarm absconds. I presume I should have gone more into the minutiæ of affairs in my article in GLEANINGS for May 15th, but it had been so many years since I used to have trouble from swarms entering wrong hives that I had nearly forgotten this part."

"Then you did have trouble from swarms entering wrong hives when you were beginning to work with swarms which had queens having clipped wings?"

"Yes, somewhat, for two or three years; and it is strange that trouble often comes along many lines to a beginner which do not come to us when we are more advanced in apiculture, even though that which we try in our advanced period may be entirely new to us. In our novice stage we lack that calmness and steadiness that we have after years of experience, and so we go at a thing with a nervousness and fear which is sure to work evil results if such results are possible. Then we are so anxious for success that we greatly magnify a slight reverse, thinking and talking of it as "*perfectly awful*." The same thing happening in our riper years would scarcely cause a ripple to come over our feelings. At least this is the way it has been with me."

"But is there no way of preventing bees entering wrong hives when returning, after missing their queen?"

"Yes. And one of the first things I learned when caring for swarms having clipped wings was that I should have near at hand from two to four old sheets or blankets to throw over any hive or hives a returning swarm might start to enter. And I used to go to the precaution of throwing a sheet over the two hives standing on either side nearest the one which had cast the swarm. But you will see how easy it was for me to forget this when I tell you that I have not used a sheet for this purpose in ten years."

"I am glad for this explanation, for it makes me feel better in knowing that you used to have trouble along the same line I have had; and as you have succeeded, I believe I can if I can only "hold out faithful." But should you not wish to use the swarm-catcher or the Heddon plan, as given in the May 15th GLEANINGS, have you no other plans to use?"

"Yes, I often use two other plans, one of which is as follows: Proceed to find the queen, as given in May 15th GLEANINGS; and when she is found and caged, turn the old hive half way around, and off the ground (to the rear) where it stood. Now place the new hive on the old stand, or where the old one stood, placing the caged queen at the entrance. As soon as the bees come back, and half or more of them have entered the new hive, let the queen run in with them. Now wait till the most of the bees have entered the new hive, and become comparatively quiet, then take the hive, swarm and all, and carry it to a new stand where you wish it to stay, after which the old hive is brought back to its old position."

"I think I understand how to do this. What is the other plan?"

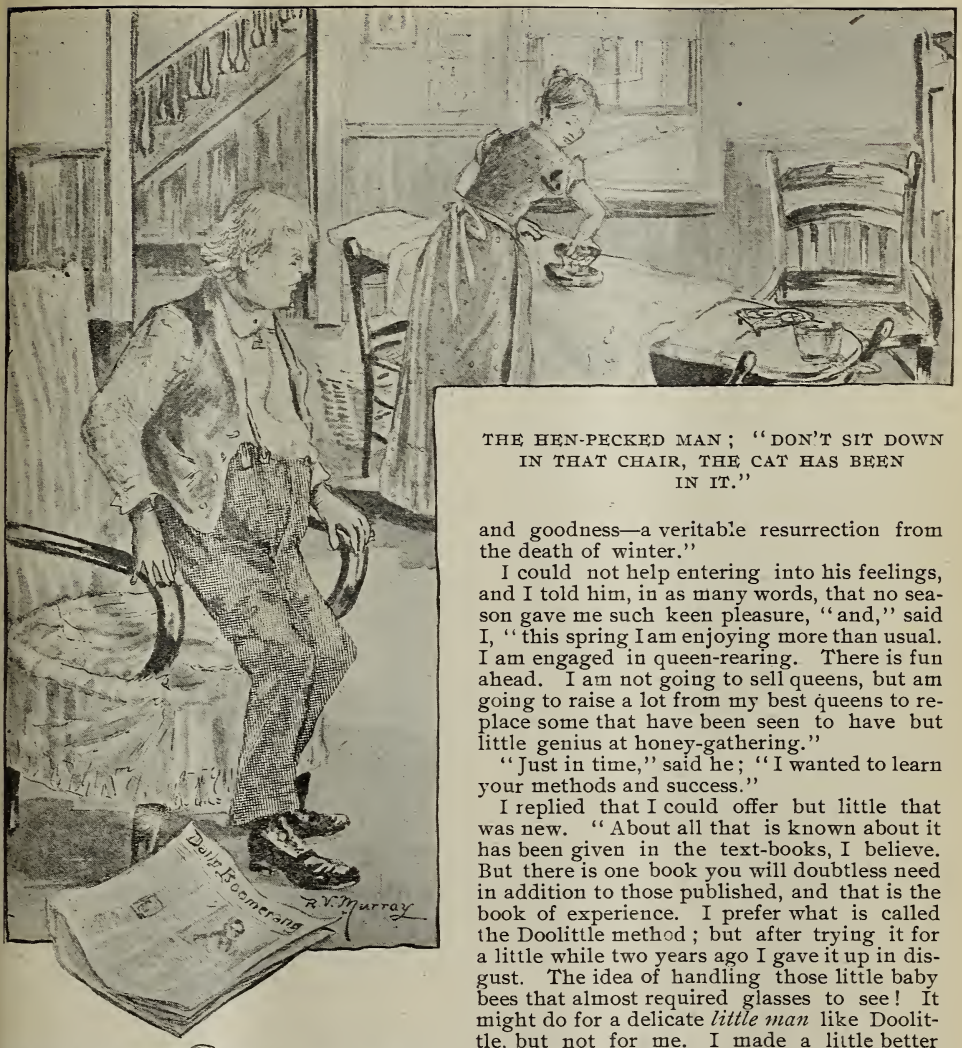
"Proceed to hunt up the queen as before; and as soon as she is found and caged, lay the cage in some convenient place; only so you do not step on the cage and kill her, as I knew a certain person to do once. Next move the hive, from which the swarm issued, to a new stand, where you wish it to remain, and place a new hive where the parent colony stood, getting the caged queen, and placing her at the entrance. In from 3 to 40 minutes the bees will miss the queen (in from 3 to 8 if they do not cluster, and in from 8 to 40 if they cluster), and come back in search for her, when she is to be allowed to go in as before spoken of."

"Well, I must bid you good day now. I am glad I came over, for I feel more encouraged to go on now."

"I am glad you came, if I have been of any help to you. I know that, to one who has been used to hiving swarms whose queens go with them, the clipped-queen management seems to have its drawbacks. But when we get a little used to it, there is a certain independence and assurance about it, as well as no climbing of trees, no cutting of limbs, nor any thing of the kind, which our fathers thought it necessary to do, that makes us feel that we are masters of the situation, and are much in advance of the old ways."

K. L. R., Wis.—The spider and Simpson honey-plants have not realized early expectations. They are scarcely mentioned in bee-literature. Sweet clover, on the other hand, is a great honey-plant, and in the future will make itself more valuable than it now does.

W. T. S., Ill.—Honey, to be boiled and disinfected, should have a little water added to it, so that when it has been boiled an hour or so it will still have the same consistency it did before it was boiled. Ordinary thick honey placed on the stove would be apt to boil all over, and it should be thinned down very materially before any attempt at heating has been made. No, there would be no danger, I think, of bees getting foul brood at an ordinary drinking-trough. So far as I know, the disease is conveyed only through the honey or the old combs that have been in diseased hives. It may be carried on the clothing of bee-keepers, but nine times out of ten it is carried by robbers from infected honey.



THE HEN-PECKED MAN; "DON'T SIT DOWN IN THAT CHAIR, THE CAT HAS BEEN IN IT."

REARING QUEENS A LA DOOLITTLE; SIZE AND SHAPE OF QUEEN-CELLS; A CRITICISM ON DOOLITTLE'S BOOK; ANTS AND KEROSENE.

"Talk of miracles," said Deacon Strong, one morning in early May, as he came in to make some inquiries in regard to queen-rearing. "Six weeks ago the earth was a veritable wilderness, while to-day every thing is instinct with life. The buds are bursting into green leaves and flowers; the earth is green; the air is vocal with birds' songs and the sweet hum of insects. Spring comes every year as a new and marvelous revelation of divine love and goodness—a veritable resurrection from the death of winter."

I could not help entering into his feelings, and I told him, in as many words, that no season gave me such keen pleasure, "and," said I, "this spring I am enjoying more than usual. I am engaged in queen-rearing. There is fun ahead. I am not going to sell queens, but am going to raise a lot from my best queens to replace some that have been seen to have but little genius at honey-gathering."

"Just in time," said he; "I wanted to learn your methods and success."

I replied that I could offer but little that was new. "About all that is known about it has been given in the text-books, I believe. But there is one book you will doubtless need in addition to those published, and that is the book of experience. I prefer what is called the Doolittle method; but after trying it for a little while two years ago I gave it up in disgust. The idea of handling those little baby bees that almost required glasses to see! It might do for a delicate *little man* like Doolittle, but not for me. I made a little better work last year, but my young queens seemed a good deal like Admiral Dewey—they were always putting in their appearance a day or two before they were expected. But I am going to put a stop to that sort of business this year."

"How is that?" inquired Deacon Strong.

"Why, I am just going to gather my eggs every day, and label them, and then I shall know when they ought to hatch if they are at all scientific."

The deacon laughed a little.

"How can you do it?" said he.

"Why, the simplest thing in the world. I shall put my best queen, that I wish to breed from, on one side of the brood-chamber, and give her two combs; one may be mostly honey, and the other with an abundance of empty cells for her to lay in. Then I will separate these combs from the rest of the brood-chamber with a queen-excluding division-board,

and every morning or evening, as most convenient, take out this comb of eggs and place on the other side of the division-board, and mark so I shall know when the eggs were laid, and give the queen another comb to lay in for the next twenty-four hours. In this way I shall have, each day, eggs by themselves, and four days later I can select larvæ that I am sure of. I shall know that the largest will be not far from two days old, and the youngest one day. Another advantage is, when going to out-yards later in the season I can find plenty of brood of just the right age all in one comb, which I can take with another comb of brood and bees and put in a nucleus hive and carry to my furthest yard, without trouble. I found this method of carrying brood from yard to yard last year entirely practical. Of course, I do not expect to rear queens away from home except during the swarming season or when honey is plentiful. I found, after some practice, I could transfer those little larvæ very readily; and once I found I had transferred some fifty larvæ in sixteen minutes; but I found it took me quite too much time to put royal jelly into the cells before placing in the larvæ. I am going to use a quill this year cut out like a trough, and fill with jelly, and then, with a stick the size of a match, run the proper amount into each cell from the end of the quill, and thus save time when time is most valuable. You will be quite likely to meet with failure from trying to use hives without sufficient bees. When Doolittle says a colony must be strong I think he means something much stronger than most of us think of when we use the same word. The disposition of bees to rear queen-cells behind or above a queen-excluding division-board seems to come from a union of the superseding and swarming instincts; and to secure the best results a colony must be strong enough to swarm, and honey must be coming in every day, either from the fields or by feeding. When you rear queens in the lower story, fewer bees will doubtless answer.

"Another thing that bothered me was to get the size of my dipping sticks just right. At first I made my artificial cells, I thought, too large. I made more sticks which seemed too small, and so I made one little mistake after another. Doolittle says he fitted his sticks into queen-cells. But I found a great variation in queen-cells; besides, queen-cells have such a way of stretching that I did not feel very sure whether they were right or not. That I might know to a dot the best size, I have made quite a number of plaster casts of the inside of well-developed queen-cells, and find them to vary both in size and shape. Some cells I found to be quite irregular, somewhat flattened, and concavo convex from base to mouth or opening. I found one cell ⅜ in., or a little more, in diameter, one way, by about $\frac{5}{16}$ in. the other diameter. A very fine cell built to supersede a queen measured slightly less than ⅜ inch in its largest diameter, and tapered slightly toward each end to $\frac{5}{16}$ or a little less. Thus you see that a stick $\frac{5}{16}$ inch in diameter at ¼ inch from the end, and ⅜ or a little less at ½ inch from the end, is about as nearly right as it is possible to get them. In making sticks, use a caliper rule and you can get them exact.

"Doolittle's work on queen-rearing is most excellent; but there is one serious fault in the last edition. You will have to study it very carefully, and learn where in any chapter to find any item you may want to look up, as there is no index except to the chapters, which seems to me a great drawback, as we often want to get some little fact that we remember in a general way—as, the best way to form a nucleus or introduce a virgin queen—and have not time to look over two or three or more pages, as it may be a whole chapter, to find it when we are short of time."

"I wonder how the Doolittle method of queen-rearing will work when you get your strain of non-swarming bees fully developed," said George Crafts, who had joined us in discussing queen-rearing.

"Well," said I, "it is rather early yet to tell; but if they fail to rear a suitable number of queen-cells above a queen-excluding honey-board—why, we shall get some other breed of bees to do it for us. How would one or two hives of Syrian bees answer? I have often wondered if it would not pay to use them for this very purpose. They would be much superior to any other race. If I could get hold of a gentle strain of these bees I think it would be well worth while."

"How do you manage to get rid of a colony of large black ants? I have one hive where these ants have fairly taken possession of the packing of shavings, and it looks as though they would be in possession of the bees and honey too pretty soon," said Deacon Strong.

"I have been troubled with them some," I replied, "and I used kerosene. You know kerosene is good for almost every thing I have found it especially good for ants. Just pour it right over them and down in the shavings. It makes them squirm, and it looks wicked, but it is effectual; and, besides, this is a world where we prey on one another.

> "'The falcon preys upon the finch,
> The finch upon the fly;
> And that a rose may breathe its breath,
> Something else must die.'

"The use of kerosene has not seemed to hurt the bees any, but you don't want to let it touch them. By the way, Jonas Jenkins was down to see me last night. He wanted to learn something about bees; said his business had not paid very well; had made some bad bargains, and was afraid he might lose his farm."

Just then Tim Fasset happened along, and his fun-loving nature could not resist the temptation to say that he thought "the worst bargain Jonas ever made was when he married Mariar."

"What do you know about Mariar?" I asked.

"Oh! my wife's first cousin lived for two years next neighbor to him. I guess she is a pretty good woman, but she is cur'us. If Jonas got tired she would say, 'Jonas, what makes you work so hard? we have only one life to live.' If he didn't work hard she

would say, 'Jonas, you ought to be stirring around; you know we are in debt.' If Jonas read a book she would say, 'My cousin Jerusha used to tell me not to ever marry a bookworm.' If Jonas was in the kitchen she would say, 'Why don't you come in the sitting-room with the rest of us?' If he went into the sitting-room, 'Jonas, why didn't you take off your boots?' and if he stood up she would say, 'Why don't you sit down?' If he went to sit down it was, 'Don't sit down in that chair, the cat has been in it.' If he talked of hiring a man she would say, 'Don't, Jonas; if you only thought so you could do your work alone; and, besides, a hired man might talk about us.' If he tried to do his work alone it was, 'Why don't you keep your work up, and not get so behind?' If he kept cows she was sure to think there was less work and just as much money in sheep; and if he had sheep she was sure to tell him that wool was away down, and it did not pay to keep sheep. I don't wonder his pigs are of the caseknife breed, or that he wants to try bees.

"Well, I didn't encourage him very much. I just told him he had better look the business up carefully before he invested, for it was a good deal easier putting money into bees than it was to get it out of them."

DRAPER BARNS FOR BROOD-REARING AND FOR HONEY.

Mr. Root:—"Blasted Hopes" is what I have to report now. I will mail you a sample section. I have never seen nice clover honey come in any faster than it has to-day. But then, the first thing in the morning and the last thing at night the old black honey-dew comes just as fast. If you know any way to keep it separate, telegraph me at once. I don't know how to do it, and I "don't know that I know who does know." Excuse me for quoting Dr. Miller, but it seems to fit. The section I send you would make a nice picture for GLEANINGS. I have never had my bees in as nice shape as I have them right now for a crop of honey, and the prospects were never better, if it were not for the bug-juice. If Mr. A. I. R. and Mr. F. A. S., on page 490, June GLEANINGS, could see the bees in those 20 barns I got of you last fall (or, rather, summer), they would never mention chaff hives or Danzenbaker hives either. I got them strong last summer, and young queens in every one of them. I put the molding for handles on the winter case instead of the body. My object was so that I could raise the winter case up around the super when it was put on this spring. The leaves were packed tight enough between the body and the winter case so that the packing would hold the winter case in place around the super. The winter-case roof was filled with leaves, and a burlap follower was nailed inside of the roof an inch and a half above the lower edge. During the latter part of February and the whole of March and part of April the wintering roof was removed every warm sunny day, so that the sun could shine direct on top of the brood-frames, covered with a quilt, and the packed roofs were turned upside down so that the sun shone on the burlap inside of the roof. I scratched the honey in the upper part of the frames with a fork a time or two, some of it three or four times. The result is that eight of those deep combs are filled with brood solid clear to the top-bar. With this arrangement there is no scattering of the leaves. The difference in color alone makes several degrees difference in warmth between chaff and the leaves. Now, then, the theory that deep brood-frames can not be equal to shallow ones on account of not getting the frames filled with brood clear up to the top-bar, is all bosh. The bees in the deep hives will get into the sections quicker than in the shallow hives, for there are about twice as many of them to get there. Chaff is not to be compared with leaves for packing. The proof of the pudding is in the eating. Try it.

Now, if you follow these hints, before the three years are up you will be a "Draper-barn" man, beyond the peradventure of a doubt. I am by the barn as our old deacon was by the Bible. It was in prayer-meeting. He said he believed the Bible, every word of it. He believed that the whale swallowed Jonah; and if the Bible had said so he would have believed that Jonah swallowed the whale just as quick. I wonder if Jonah felt any bluer while he was "in the belly of the fish" than I do now over the honey-dew. I'll try it over.

A. N. DRAPER.

Upper Alton, Ill., June 6.

[There is no question but those large barn frames are well adapted for brood-rearing. The queen seems to like to fill them up solid; for on these frames she can make an almost perfect circle of brood; while in a Langstroth or a shallower frame the circle is broken. Personally I expect much from Draper barns in the future in the way of honey — for some localities at least. One can go through one of these barns and see every inch of comb in very much less time than he can see an equivalent surface of comb in a double-brood-chamber hive. Neither are the big frames awkward to handle.

The fact that these barns use the same bottom-boards and covers as the regular ten-frame Langstroth size is quite a recommendation in their favor.—ED.]

BELGIAN HARES.

I have raised Belgian hares for two years, and find it profitable. They would gnaw young trees if they got a chance, but I have always kept them confined. There is too much danger from dogs and cats if they run loose. They are very prolific, as a doe will bear from six to ten every two months through the year. They have thick fur, and the hide is as tough as a musk-rat's. Their meat is as

white and tender as frogs' legs. They are rather tender, and are liable to die without apparent cause; but if care is taken to keep every thing clean there will be little loss.

Cicero, Ind., July 2. S. W. CARSON.

INTRODUCING QUEENS WITH TOBACCO SMOKE; THE USE OF IT AMONG BEES IN GENERAL.

Last summer I lost six queens in introducing according to directions sent out by breeders; but I quit that method and took A. I R.'s method, hinted at in an old edition of the A B C, using tobacco smoke at sundown. Out of 36 I never lost one. Why don't you recommend it more? B. F. JONES.

Idaho Falls, Idaho, May 7.

[Tobacco smoke for the purpose of handling bees should be used very sparingly and carefully. It is hardly safe to advise beginners to use it, for its effect is to stupefy the whole colony; and if the fumes are administered during the day there will be an hour or two hours, perhaps, when the bees, slightly intoxicated, would put up no defense whatever at the entrances. If during the robbing season, they would allow robbers to come right in pellmell and help themselves; hence tobacco smoke is recommended for use only at night. But even then I suspect the introduction could be accomplished almost as well without the weed. The best time to introduce queens is toward night. We once released two dozen queens right among the bees, and every one was accepted. The queens in this case were some that came through the mails, badly daubed, and reached us just at nightfall. Nothing remained but to let the queens run loose and take their chances, and we were very greatly surprised the next morning to find all of them apparently nicely accepted.

In peculiarly stubborn cases tobacco smoke may be used, especially where the bees are determined to ball the queen, and we have positive evidence that the bees are queenless. I have made a colony so "beastly drunk" (pardon the expression) that when the bees finally recovered from their spree they accepted the queen, when before that they would ball her on sight.

Our practice now is to use tobacco smoke only during fair time, for, unfortunately, our county fairgrounds are within an eighth of a mile of our apiary; and during the time the stands are making taffy, selling watermelons, lemonade, and the like, our bees would prove to be a great nuisance unless we went around to all the hives and gave a smudging of tobacco smoke. This is done in the morning, about 8 o'clock, and another dose is given about 1 o'clock Half a dozen puffs of smoke are blown in at the entrances, all over the apiary. If the colonies *are all* stupefied there will be no danger from robbing. This smudging keeps the bees at home. But care should be exercised, as there is danger of overdoing it, and also danger of not doing *enough* of it; for if they have once got a taste of the sweets over at the fairground it takes a great deal of stupefying to keep them at home.—ED.]

QUEENS FLYING ON EMERGING FROM THE CELLS.

Noticing several references to the power of flight of young queens on emerging from the cell, in recent numbers of GLEANINGS, I will relate my experience.

I cut two cells from a frame of brood. On opening one I found an immature queen, white and motionless. The other contained a very vigorous young queen which came out as soon as the cell was opened, and flew off a few feet. As I had no use for her I thought I would see how well she could fly. I held her up on my hand about six feet high. Starting from that she flew a circular course of about fifty feet, alighting on a catalpa limb about fifteen feet from the ground. Resting there about a minute she arose, circled around twice, and flew out of sight over the top of my house, which is thirty feet high. Her mother is a hybrid, about five per cent of her workers black; the remainder show three bands plainly. F. G. ANDERSON.

Wabash, Va., May 15.

[I have had queens fly immediately on emerging from the cells, but never more than four or five feet. The circumstance you relate is quite out of the ordinary, and yet I have no reason to doubt it.

These circumstances of a queen flying immediately after hatching are explained by the fact that bees often confine their queen-mothers in the queen-cells for several days after the time they should have hatched. It has been suggested that, while they are thus confined, they are fed by the bees. This temporary imprisonment seems to be for the purpose of allowing second and third swarms to depart, each taking a virgin queen; and the bees know that if all young queens emerged at one time, or about one time, there would be a royal battle, resulting in one queen only; and as bees apparently like the fun of swarming, they use the scheme of imprisoning so they can have several gala times. Pardon me if this seams to be somewhat fanciful; but it is pretty well established that the queens are confined, and, if confined, I can conceive of no other reason than the one given.

Well now, then, a queen that has been held in her cell, and been fed, would, when released, be able, probably, to fly quite a distance; although it must feel a little queer to the young to-be-mother to emerge from her dark cell for the *first time* and suddenly find herself transported out into the open, into glorious sunshine, there to enjoy the beauties of nature. The transformation is as magical as it is sudden.—ED.]

Please tell us in GLEANINGS how many acres of buckwheat it will take to keep 100 colonies of bees busy. E. M. HAYES.

Kilbourne, Wis.

[This is a hard question to answer. Five hundred acres *might* be enough. I can only conjecture.—ED.]

HOW FAR DO BEES FLY FROM CHOICE?

I saw an article in the *Australian Bee Bulletin*, July 24, 1897, from Mr. G. M. Doolittle, where he claims his bees gather honey from basswood seven and eight miles from his apiary. I take three bee-journals, but I have not seen the question discussed yet in any of them. I am sure it would be interesting to hear the reports from different people. When I first got the Italians I watched a good deal, but I never found them over two miles from the apiary; of course, there was plenty of forage within that distance. H. SMITH.

Moss Glen, Tasmania, April 10.

[I am very sure that Mr. Doolittle did not intend to be quoted as saying that his bees flew seven or eight miles from choice. When he made the statement in question it was the extremes of flight that he had noticed in his experience, such extremes being only when his bees could not get nectar nearer. As a rule, bees will not fly much over a mile and a half or two miles—that is, providing there is a supply of nectar in the radius named; but if there is none to be had within that distance they will fly further. Sometimes they have gone 15 miles across bodies of water. When basswood is in bloom profusely, and there is *plenty of it* within a mile, the bees will not go further than that. As long as they can get all they can carry home within a mile, it would be poor policy to fly further.—ED.]

HOW TO FIND QUEENS; CURING FOUL BROOD WITHOUT SACRIFICING HEALTHY BROOD.

To find a queen, open the hive rather roughly; quickly move frames apart, just far enough so that the bees can not reach from one comb to another. In from one to two minutes the bees will set up a call of lost queen, and then converge toward the comb she is on. In this way she is readily found.

In requeening a large quantity at once, place the caged queen over the brood frames the night before. Next morning you will find the queen you wish to remove, either on the cage or on the comb immediately below. This, in requeening a large number, is a great saver of time.

Remove queen of infected colony at commencement of honey-flow, on account of less danger from robbing. Let the colony rear a new queen. When she is ready to lay, the old brood will all be hatched; transfer *a la* McEvoy, and a permanent cure is sure, as the bees have no larval food on hand. Extract the honey, boil thoroughly, and after two days boil again, and use to feed. Render wax, remelt, and boil twice, and it is safe.

ANOTHER METHOD.

Shake bees off *a la* McEvoy into a new hive on old stand. Return the combs to the old hive, and place at the end of the hive with entrance at right angles to old stand. Close entrance of old stand, bore a hole an inch in diameter, over which place a tin tube six inches long, an inch in diameter, tapering to ⅜ inch at small end. This end is to lead to the entrance of the other hive. Close all other means of egress or ingress. The young bees invariably draw into the old stock. In five weeks the transfer is complete. Utilize or destroy old combs. W. W. CASE.

Baptisttown, N. J., June 26.

[If I am not very much mistaken, I have tried the plan of separating the combs, for some one had said the bees would set up a call, and that they would work toward the frame on which the queen was. While some colonies might do it, those I tried did not do any thing that gave me an inkling of where the queen was.

But your method of requeening large apiaries would, I think, do very nicely, for a queen already in the hive would be quite likely to be near the caged queen, out of motives of jealousy, and with the evident desire to meet in mortal combat to settle the question of who shall be boss.

Your method of curing foul brood would work very well; but the first plan spoken of would be far better than the second one. Neither one of them should be used unless it is at the beginning of the honey-flow, when there would be no robbing about. During the robbing season it is not safe to leave a foul-broody colony in the apiary for *one day*.—ED.]

THICK VS. THIN SECTIONS.

Would not a section 3×5 in size by 2¼ thick or broad be much better than a thin one 4×5 square? I think a cake of honey 3×5×2¼ would look very tempting on the table. It would take up as little room, and fit as many dishes, as any form I have yet seen. It would require less foundation, and give less of what some term "fish-bone." Such a package would weigh at least one pound, and fool no one, as the broad thin one with its shallow cell often does. It seems to say, "Buy me; see what a great lump of honey you will get," at the same time showing its broad side to the customer in order to deceive as much as possible, knowing every word to be false, which the purchaser finds out to his sorrow when he has slipped it out of its slick case. Some may say bees will not draw out and fill the thick comb as quickly or as readily as a thin one. My experience has led me to believe that, in storing honey, bees rather like (or, I may say, prefer) deep cells, and they will draw out and fill the deep sections quicker, considering the amount of sweet they store, as they will have less comb to work and less capping over to do. I have noticed, when they are storing honey in their brood-chamber, they build their comb much thicker than that in which they rear their young; and if the frames are far enough apart to allow, they will often build their comb 2½ inches thick.

Two years ago I thought I would try to obtain a sort of novelty in section honey to exhibit at our county fair, so I constructed a few broad sections, fastening two standard sections together, and sticking the foundation between the two. Then I arranged a super so these broad sections would fit; put them in, and set the super over one of my best colonies; and the result was, at fair time I had some as

nice well-filled and well-sealed sections of honey as I ever saw, weighing about 1½ pounds each. L. O. WESTCOTT.

Swanton, Neb.

[A section 3×5×2¼ thick would give a very nice chunk of honey under the right conditions. But one of the objections to thick combs is that in many places, or where the season is very short, the bees do not have time enough to fill them. As a consequence, ¾ and possibly $\frac{9}{10}$ of all such combs would be uncapped—that is to say, unfinished, at the close of the season. It has been our experience that the thinner combs, while possibly containing more wax to the pound of honey, will be filled sooner, and be more likely to be capped over, than the thicker ones; and then the argument has been advanced that honey ripens better in shallow cells, and ripens sooner. In any of these things it is not wise to go to either extreme; but where the golden mean is, we do not exactly know; but I agree with you that a comb from a section 2¼ inches thick will be very fine eating—that is, *providing* the honey is thoroughly ripened.—ED.]

HOW FAR WILL BEES FLY TO GATHER STORES? A QUEEN FROM YOUNG OR OLD LARVÆ; FLORIDA NOT THE MECCA FOR BEE-KEEPERS.

As I am a subscriber to your journal I wish to ask a few questions in regard to bees. 1. How far will bees fly to gather stores? 2. Is a queen raised from larvæ over three days old as prolific as one from younger larvæ, or eggs under three days? Please give me your opinion in regard to shade for a bee-yard, whether too much is detrimental to their prosperity or not.

By reading the article in June 1st issue, from Marchant, Fla. (the 3000 hives, etc.), it prompts me to make a few remarks. I have lived in this State since 1874, and have camped, hunted, and cut a great many bee-trees, and in a great many different countries, but have never thought Florida a bee Mecca yet. On the whole, in my humble opinion it is a poor bee country, and nothing to compare to one where white clover grows. There is a profusion of wild flowers here, but they are not nectar-producing. For instance, basswood is plentiful here (wah-hoo is the native name), but I have never seen a bee on the bloom. Another instance, I have now and have had Japanese buckwheat before growing here, which blooms and makes fine grain, but I have never seen a bee work on it. There are millions of aquatic flowers and lilies here in my immediate vicinity, but no good for bees. Five years ago, when we had plenty of orange bloom the honey-flow was good for about three weeks or a month; but since then, frosts have cut all citrus growth to the ground every year but one, and orange-groves here seem to be a thing of the past. B. B. KEEP.

Boardman, Fla., June 10.

[On the question of the age of larvæ for queen-rearing, I hardly know my own mind. Dr. Miller's experiments have thrown new light on the matter. I refer to what he says on page 521, July 1, and also to one of his Straws in this issue. As to the amount of shade, a good deal will depend on the locality. In Florida I should suppose one could hardly have too much. In the North a colony ought not to have shade before nine o'clock nor after three o'clock in the day.—ED.]

GREASY SECTIONS IN THE CENTER OF THE SUPER THE CAUSE.

Mr. Editor:—On page 427 is a quotation from the *Australian Bee-keeper;* viz., "Have you ever noticed that sections over the center of the brood have a more greasy appearance than those to one side?" intimating that such is the fact, and then asks, "What is the cause?" On page 432, same issue, Mr. E. H. Schaeffle gives an answer to the question, which to me is cogent and clear. It seems to be universally admitted that colonies referred to are very populous during the season of honey-flow, and are wonderful honey-gatherers. Now, it would seem that this fact ought to arrest the attention of every investigator, and cause him to readjust his mental microscope for a closer observation; to make a more thorough examination into the causes which bring about results so *desirable* in one aspect, and so *undesirable* in another. Many of the attempts to prove the queen at fault prove too much for the tenability of the position taken, and which it would please me to review; but perhaps enough has been said already, pro and con, to set on foot further investigation into this most interesting subject connected with bee-keeping. What I desire to say and emphasize is, that I've not yet received a single intimation from any one that he has a queen for me. You can scarcely imagine how disappointed I am. Allow me to say again, to any one who has a three-banded Italian queen which fills her hive with greasy-section-producing bees: Don't pinch her head, but properly cage and mail her to me. Twenty-five cents in stamps will be returned for every such worthless queen.

WM. M. WHITNEY.

Kankakee, Ill., June 7.

[I am inclined to think that E. H. Schaeffle is very nearly right—that a contracted entrance on a hot day will do much toward softening the cappings, causing them to fall on the surface of the honey.—ED.]

Could cell-bottoms with eggs be used for transferring by the Doolittle method, instead of larvæ? W. R. L. DWYER.

[Probably, but I should prefer the larvæ just hatched.—ED.]

Where can we people in the East get Belgian hares to breed from? WINTON BALL.

Rugby, Va., June 16.

[I do not know where Belgian hares can be purchased; but you doubtless could get particulars by writing to F. Greiner, Naples, N. Y. —ED.]

"PLAGUE TAKE THAT BEE!"

In another column in this issue is illustrated not an uncommon occurrence of what may have happened in our younger days. When the white clovers are in bloom, and the bees are busily at work on them, the small boy is often reminded of the fact in a very pointed way. He knows just what has happened, and generally lets every one else know. In nine cases out of ten he will give free rein to his noise-making apparatus in a series of boo-hoo-ow-oo-ow-oo-ouch! He never thinks of removing the sting, but runs or hops around on one leg. The foot swells, and then he begins to scratch it; and the more he scratches, the more it swells and the more it itches. He is told not to scratch it, but he says he's "got to, 'cause, 'cause, it itches." Sympathizing friends will do the foot up in mud; others will dose on vinegar, saleratus water, and the like; but probably not one of them will have the sense to remove the sting if it is still in the wound; and in two days, if the trouble is over, he may be stung again. But go barefoot *he will*, stings or no stings.

The picture was executed to order by our special artist, R. V. Murray, for our A B C of Bee Culture.

WINTERING BEES IN COLORADO; OUT IN A COLORADO SAND-STORM.

In our issue for July 15 I promised to tell something about my experience in the sand-storm in Colorado. We were at Longmont, and Mr. Rauchfuss and myself, a night or two after Thanksgiving, were looking up into the sky. Mr. R. remarked, as he scanned the horizon, "We shall probably have a sand-storm to-morrow."

"That is just what I have been wanting to see," I said.

"Well, after you have seen one, may be you will not want to see another one," he remarked.

"Why so?" I asked.

"You will find out to-morrow."

I did not see any thing peculiar about the sky. It looked remarkably clear, and I enjoyed being able to sit out in the open air until after 11 o'clock without feeling any dew nor experiencing a chilly feeling. We were both at the hotel, for we had just come from a family where there was scarlet fever, and we did not feel like visiting the residences of bee-keepers of Longmont. But Mr. J. E. Lyon and Mr. Philip Large, of that place, had promised to take us out to the foothills of the mountains next day, and, incidentally, take us round among some of the apiaries of the vicinity.

The following morning opened up bright, but it was evident that some sort of storm was brewing. By the time Mr. Lyon and Mr. Large came after us with a buggy it seemed like a perfect hurricane. But nothing would prevent us from taking the projected trip, and accordingly we four got into the buggy.

Clouds of sand were blowing in every direction. Indeed, it was almost impossible to see any distance ahead of us at times, for the wind had picked up every thing loose in the streets and in the outlying country, and apparently was pouring it down our necks. I buttoned up my coat collar, pulled my felt cap clear down over my ears so that I looked like a genuine tramp; but the Colorado sand had a fashion of getting into my eyes, ears, and mouth, and down my neck just the same. At all events, I noticed that the other fellows didn't try to keep it out, and they were wise, I am thinking. I had heard much about the clear atmosphere of Colorado, and had had some delightful evidence of it; but I was convinced there was not always clear air there to breathe.

We stopped at Mr. Large's home apiary, and looked at his solar wax-extractor, mention of which I have already made. Then we four got into the buggy for the foothills, some 12 or 15 miles away, but which really seemed to be only a mile or so away. I had my camera with me, prepared to take snap shots of jack-rabbits or any thing unusual or extraordinary; but the sand filled the air so much that it was almost impossible to see any thing, much less take pictures. After we had gone some six or seven miles I asked the boys where they were going.

"We are going to the foothills, of course."

"Well, you have been going there for the last hour," I said.

My teeth were chattering, and filled with sand, and so were my ears. I was chilled through, and the other fellows ditto.

"Well," said I, "have we *got* to go to the foothills to-day?"

"No," they said; "we are going for *your* benefit."

"For *my* benefit!" said I, as another shower of sand went down my back. "Suppose you turn around. I have had all of the foothills, all of the sand storm and all of the Colorado atmosphere I want this morning; and if you fellows have had enough, I certainly have."

With that they turned right about face. I thought I had been facing the wind in going out, but we had no sooner turned around than the wind was again in our faces, or, rather, it was a perfect whirlwind of sand.

On our way back we stopped at one of the out-yards of Mr. Lyon, which was all prepared for winter. The extracting-house had been blown over on its side. His hives were out in the open, in groups of eight or ten, under little sheds. Nothwithstanding the sand was blowing about furiously in every direction, I said I believed I would attempt to take a photo. I poised the camera on two hives, and took a time view—yes, two or three of them—for I did not know what I could get in such a storm of sand. The picture is given in another column, and it is not so bad but one can easily see that the atmosphere was not as "clear as a crystal" that day. The hives are

placed close together for the sake of warmth, and under a small shed which backs up against the prevailing winds. The hives were of the Wisconsin type, with porticos. On top of the brood-frames was a carpet or quilt; over this a cover with a two-inch space under it, held down in some cases with stones as shown. This arrangement gives about as good results for wintering as any thing that has been tried, I believe. Colonies in double-walled chaff-packed hives have no advantage over those in single-walled hives.

While the winters in Colorado are severe in a way, there are no long protracted cold spells running away below zero and continuing there for two or three weeks at a time. The mercury may go down to zero, but the next day may be quite warm and balmy.

I saw a good many apiaries put up on this general plan of wintering, as shown in the illustration on page 563, in this issue, and it seemed to be the prevailing method. The main idea is to keep off the sharp winds and to have a very thin light packing over the brood-frames. More was positively detrimental. I also learned that these sand-storms blow the sand over every thing—into the entrances and into the combs sometimes, so that honey and sand are mixed together in the same cells. To provide against this sand blowing into the entrance, and getting into the combs, the Rauchfuss brothers have constructed a sort of tenement hive, shown on page 565. At one end of this hive stands Mr. W. L. Porter, of Denver, whose picture I have already given in these columns, and of whom I have previously spoken. It was a cool afternoon when I visited at the ranch of Herman Rauchfuss, who was absent at the time. While he was gone to town I used the camera right and left; but there was no sand blowing that day, as you will see the picture is very much clearer.

This sand-proof hive holds three colonies, and the peculiar feature of it is the entrance. The bees pass inward, and up a perpendicular space, then off cata-cornerwise to the brood-frames. At all events it is so arranged as to intercept all sand that would blow into the hives, thus keeping the combs clean. The hive is adapted to take Langstroth frames, and, being made of matched stuff, it presents a very neat and pretty appearance. The few bricks and stones on the cover show the necessity of having the covers weighted down to provide against heavy winds that rage so furiously in that State at times.

THE HONEY SEASON FOR 1900.

REPORTS are still coming in from all sections of the country; and so far the revised outlook stands about as follows:

Michigan seems to be having a good honey-flow—at least I do not remember seeing an unfavorable report, while we have on file a large number of good ones. Colorado, Arizona, and other of the Western States depending on alfalfa, will have their usual honey-flows. In California the reports range all the way from one-third or one-half a crop down to total failures. In New York the reports are unfavorable as a rule—no clover or basswood to speak of. From Pennsylvania there are a few favorable reports. From New Jersey come quite a number of good reports. Reports from Florida vary greatly. Some show a third of a crop; others a total failure. Texas will have a good deal of honey from some sections, and almost none from others. Some of the Southern States will have very little honey. Missouri, that had a crop of honey all over the State last year, has nothing to report this year to speak of. The season in Wisconsin is practically a total failure; a little better in Minnesota. In Iowa and Illinois it is fair to poor. Dr. C. C. Miller is getting his usual crop of honey, or at least he reports he is doing as well as he did last year; but he does not know where the honey is coming from.

Notwithstanding the season seems to be generally unfavorable, we have a large number of good reports from all over the country that read something like this:

"An extra good honey crop."

"Season fine."

"Lots of honey—seems like old times."

"Honey is just rolling in."

So far no large amount of honey has found its way to the centers of honey distribution. At present it is a little too early; but there will be considerable alfalfa honey this year to dispose of, both comb and extracted; a very scant supply of ordinary white clover, and a light supply of red clover and of basswood.

Taking it all in all, the supply of white-clover honey and basswood will be very light this year. Honey, if any is sold at all, will be principally alfalfa with some mountain sage from California, perhaps. There will be on the market, as usual, Southern honeys; and, in all probability, from the large amount of warm rains that seem to be general over the country, there will be a good fall crop; that is to say, the bees will probably ga'her enough from fall flowers to fill their hives and save feeding. If they will do this much, bee-keepers will probably feel fortunate.

In the mean time I hope our bee-keeping friends will continue to send in their reports, as it is highly desirable to keep in touch with the season as far as possible.

MEASURING BEES' TONGUES.

The following from the Michigan Experiment Station, written by J. M. Rankin, to whom I sent a glossometer—an instrument for measuring bees' tongues—will explain itself:

Mr. Root:—I am going to be one of your competitors for your premium on "long-tongued bees," as offered by you on page 536.

I am glad to know that there is *one* practical man who has begun to realize the importance of this one quality of the bee. As you doubtless know, I have been working on this for the past three years with some little success and a great deal of discouragement and failure. I have found but one man with whom I have talked who does not think I am crazy, and he gives me no encouragement.

My reports on this work have never been published because they were considered impractical. I am almost ready to report on the little apparatus you so kindly sent me for measuring the tongues; but I am sorry to say that I am afraid it will be an unfavorable report. What is a glossometer? and how much does

the apparatus cost? I have made many observations similar to yours from time to time. I can give you some figures on the length of the tongues of different strains, which may be as interesting to you as they are to me. The Italians are much ahead of any blacks that I have ever measured, and I have had bees from all over the United States. J. M. RANKIN.
Mich. Exp. Station, July 5.

There, friend Rankin, give me your hand. If there are two of us crazy, then we will take the consequences. I shall be glad to get your report so that we may see what you have accomplished. Worth publishing! Perhaps if the report were given to the world it might show the impracticability of the scheme more than any thing else.

About the glossometer, J. H. Martin, then of Hartford, N. Y., made an instrument for measuring bees' tongues; but outside of this, and a little device I sent you, I know of no others in existence. I do not know how Martin measured tongues, but it seems to me the most practicable method is to kill the bees with chloroform, stretch the tongues out under the microscope, and then measure with a micrometer scale. I have done something of this already, and believe the scheme is perfectly practicable.

With regard to your report, if you send us nothing more than your measurements, showing the tongues of different varieties of bees, that will be all we will ask for the present. It will give us data to work from, and possibly a point to strive at. I would suggest that measurements be given in hundredths of an inch instead of the French system, which is so little understood by common people as a rule.

ACTUAL MEASUREMENTS OF BEES' TONGUES AT MEDINA.

Later.—Mr. J. P. Moore, a queen-breeder of Morgan, Ky., sent me four cages of bees that I might measure their tongues. I also measured the tongues of bees of a Doolittle queen, and tongues of some black hybrids from our own yard. I expected to find a very great variation, but I did not find it. All the tongues I measured would reach easily $\frac{15}{100}$ inch. By exerting a little pressure on the head of a decapitated bee just chloroformed I could get most of the tongues to stretch to $\frac{18}{100}$.

Mr. F L. Sladen, in 1887, as reported in GLEANINGS for that year, measured some tongues of the *Apis dorsata* bees, and he found these to be 4 millimeters long, or $\frac{16}{100}$ inch. He also measured the tongues of *Apis mellifica*, and found them to be 3½ millimeters, which would be $\frac{14}{100}$. The latter, I suspect, were the common black bees of England, and we have always supposed that the tongues of the pure blacks were much shorter than those of pure Italians. From this it would appear that Italians have longer tongues than any other bees we know of. I should be glad to measure the tongues of other bees that may be sent in, and render a report through these columns.

My *modus operandi* is this: I first chloroform the bees, when they will stick their tongues out, as they will always do when suffocated. They are next decapitated, when the head and tongue are laid down on the fine gradations of a micrometer scale. The whole is then viewed under a strong magnifier, and the hundredths can then be counted off after the tongue is stretched out with a dissecting-tool.

BEES WITH LONG TONGUES; RED-CLOVER HEADS WITH SHORT COROLLA-TUBES.

THE following letter from Prof. E. C. Green, of the Ohio Experiment Station, Wooster, in line with what I wrote in our last issue, has been received, and will bear careful reading on the part of every one of our readers in regions where red clover is grown:

Friend Root:—In the last GLEANINGS you give an interesting talk on how tons of honey might be saved if there were only bees with tongues long enough to reach the nectar in the blossoms of red clover. Your solution of the problem is simple *if* it can be done, and it will, perhaps, be some time. But while working in that direction it seems to me as if there were another way the problem might be solved; and that is, to raise a strain of red clover with corolla tubes short enough so that the bees we already have can reach the honey. Apply your glossometer to the red clover as well as the bees' tongues. I believe I am safe in saying that the structure of plants can be more easily varied in a given direction than animals. Although red clover is not usually selected, as in many plants, down to the individual plant, there is no reason why it can not be done. Let some close observer watch closely a field of clover; and when he finds a head that bees work on freely let him save seed, and perhaps from this he may develop a kind of red clover that will be of use to the bee, and then let the bee-keepers furnish this seed to the farmer, as you have suggested seed could be furnished free to the farmer within a mile and a half of the apiary. I feel satisfied that the farmers would be glad to plant such seed if it were as good as other clover for their purpose, and A. I. would boom it in his very best style. Now offer a prize for a pound of "short-tube" red clover, or whatever you have a mind to call it, and work at the problem from the other direction.
Medina, O., July 6. E. C. GREEN.

I have read Prof. Green's article over with a good deal of interest, and it strikes me he has given us a lead that we may well consider. We know that we have already accomplished something in the way of long-tongued bees, and we feel confident that we can do something more; but from what Prof. Green writes I should be inclined to believe much more could be accomplished in the shortening of corolla-tubes of red clover. I hope this matter may be taken up at the Ohio Experiment Station, under Prof. Green's direction, and in the mean time I hope our bee-keepers will be on the watch for red-clover heads with short tubes. Mark these in some way so that they can be distinguished when they go to seed. Preserve the seed carefully, and sow them in a small patch next year. From this patch select again the shortest tubes, and thus continue on until a short-tubed clover is developed. If this kind of clover could be secured, the bee-keepers could well afford to furnish the farmers the seed free, and the result would be that such seed would be disseminated all over the country.

L. M. H., N. C.—The ordinary bee-martin and king-bird are the only ones I know of that do any damage in the apiary killing bees, and they do no particular damage where no queen-rearing is being carried on. We should not suppose that ordinary martins would do any harm whatever.

Dear friends, what I have to say just now will come under the head of Travels, Homes, and Gardening—all three, and I do not see how I can well separate them. Under the circumstances I can not well choose a text either; for if I do I shall not stick to it. I shall, however, get around to some texts now and then that have been a good deal on my mind: "A new commandment I give unto you, That ye love one another;" and, "We be brethren."

Some time ago our good friend Pike the florist invited me to call and see his greenhouses. He said he was not far away from Dr. Miller's; and then I told our folks that, whenever there was a low rate on the railroads leading into Chicago, I was going to take a trip that way; therefore when I saw that a special rate of only $8 50 would be made from Medina to Chicago and return on June 26, I decided that was my time to go. This special rate was on account of the national Prohibition convention; and as I have of late been trying to post myself in regard to all political parties I decided to take in at least a part of the convention. Some people, when they are going to take a long ride in the cars, take along a book or a paper. I have sometimes done so, but of late I never want any book or paper—that is, while the cars are in motion. I never want any printed page when I can have the book of nature spread out before me, passing like a panorama.

WHITE CLOVER IN CULTIVATED FIELDS.

As I approached Toledo I was struck, as I have been before, by the wonderful fertility of the soil and the great crops occupying almost every acre. But this time I was delighted and astonished to see some fields of white clover, eclipsing any thing I had ever seen before. You usually find white clover mixed in with timothy, and often with red and alsike clover. When near Toledo there was field after field of *pure white clover*, and nothing else—not a spear of grass—in fact, not even a *clover* leaf broke the expanse of heads of white clover. They were not only as thick as they could stand, but they seemed piled one on the other, two or three deep. I can not think it was natural growth, for the fields were thrown up in beds, with dead furrows at regular intervals. I think it must be grown for the seed; and if so, what a wonderful chance for bees! I wonder if Dr. Mason has seen these white-clover fields, and can tell us any thing about it. In describing it to our veteran bee-keeper M. M. Baldridge, of St. Charles, Ill., he said it was probably white Dutch clover, grown for seed. He said that, some years ago, a man in Wisconsin who made a specialty of white Dutch clover seed for market succeeded in growing $100 worth of seed on one acre of ground. Can any of our readers tell us something more about it? I know there was a time when white Dutch clover seed brought from $12.00 to $14.00 a bushel. Is it possible to grow six or more bushels to the acre? and how much are such fields worth to the bee-keeper? The glimpse I got out of the open car-window revived my old enthusiasm in regard to a model honey-farm. Permit me to say, parenthetically, that we sowed our buckwheat and crimson clover with a sprinkling of turnip seed, all together, yesterday, July 4. It is a little early, but we had the ground ready (a clover sod turned under), and I thought I would try extra early sowing on all three. I will now go back to my travels, and a slight change of subject.

I reached Chicago between 9 and 10 o'clock at night. As I passed out of the Lakeshore Depot I thought of what the *New Voice* had said in regard to saloons in that great city. There they were, sure enough, thick on every street. All sorts of inducements were thrown out to get people to enter. I will mention just one of the attractive advertisements. On a great building, in large letters, there is a proclamation something like this: "I am the man who first inaugurated Kentucky whisky at only 5 cents a glass." A sign, with the man's name on it, was just below this inscription, and many other reasons were given why one should patronize this establishment instead of a hundred others roundabout. This person seemed to think he had conferred a lasting benefit on humanity, something like the man who invented the mowing-machine and reaper, the telegraph, etc. But *he* was the *pioneer;* and people out of gratitude, looking to him as a benefactor to his race, should buy their *Kentucky whisky* there. Again and again in passing through Chicago I was struck with the suggestion that the people engaged in the liquor-traffic did not even seem to know that anybody *objects* to their business. Evidently, it has never occurred to them that more than half of the people of the United States are opposed to the business they are engaged in.

Before 4 o'clock next morning I was up and dressed, and my wheel and I sallied out of the hotel. When I am in a great city like Chicago I can not afford to waste precious hours. By 5 o'clock I was out in Lincoln Park, a good many miles away, admiring the flowers, the green lawns, the beautiful wheel-paths, and thanking God that he had given me a human life to live. The flowers possessed a new beauty for me this time, because I knew the names of most of them. I was somewhat disappointed, however, in not finding any nice colei in the open air. In fact, I did not see any at Vaughn's great string of greenhouses, nor anywhere else on this trip. As nearly as I could learn, the weather has been unfavorable for the coleus outdoors; but with warm nights and sunshiny days they will probably put on their gorgeous hues later on. It was consoling to me to find this state of affairs, because we have succeeded so poorly in getting handsome colei on our own grounds in the open air. The most attractive bed to me at Lincoln Park was a collection of ten-weeks' stocks. At a distance a plant in full bloom looks considerably like a hyacinth. There is a tall stalk with flowers set closely

around the stems. The center of the bed was planted to flowers perfectly white ; and around the white was a belt of pink, then purple ; outside of this a wider belt of blue, or a purplish blue ; then the whole oval bed was bordered with dusty miller. There are several of these beds in Lincoln Park. When they are sparkling with the dew of the morning, the effect is enough to make one throw up his hat with a shout of delight. There were other combinations that were particularly fine ; but this one, on account of its newness, perhaps, to me, excelled them all.

By 8 o'clock I was back in the city, at the Lexington Hotel, the headquarters of the convention. Although I am not a member of the Prohibition party, I was very kindly welcomed by the delegates from Ohio, and invited to take a seat in their special parlor ; and I do not know that it was ever my fortune to be thrown among a lot of brighter, keener, and *cleaner* men than I met there. Not only are they temperate so far as liquor is concerned, but I hardly think there was a man in the room who used tobacco in any shape or manner. Perhaps some of you will say, "Why, then, Bro. Root, are you not one of them?" I will try to answer very briefly.

In our own town of Medina almost every thing is settled in our primary caucuses, and the Republicans, at present, have the upper hand. A man may be ever so good a scholar, and he may have every qualification to fit him to advise and direct in the affairs of the town; but unless he is a Republican his vote is a cipher, and nothing more. Not only can he have no word in regard to who shall be on the town council ("wet" or "dry"), but he has no part in selecting good men for our board of education. If his wife presumes to take part in electing a school board, she will be asked at once if her husband is a Republican ; and if not, she is ruled out. I am told this is not the case in every town. Thank God if that is true. I know there are thousands who are longing and praying that the time may come when we can vote for the best men without any regard to what political party they belong to. May be I have not got the above exactly right ; but even if this is true, it is pretty *nearly* right, and there is more or less of this state of affairs throughout the whole United States of America. Ours is a dry town, and by the grace of God we have kept it dry for many years past. Very likely The A. I. Root Co. has of late years had considerable weight and influence in keeping the town dry as well as the surrounding townships ; but if the members of our company should support any ticket other than the Republican, their work and influence for temperance, purity, and every thing else, would be cut off. Good men and good women have for years past lamented this state of affairs.

Now, perhaps I am getting into deep water in what I am going to say ; but I think I am pretty nearly right, if not entirely. Some years ago the Christian men and good temperance men of Ohio, recognizing the condition of affairs which I have described, banded themselves together for the purpose of restraining the saloon by what they call the Anti-saloon League. This League was to work with the present existing political parties. Our men were to be selected *from* all parties, and we as an organization were to labor *with* all parties. At the time it was organized I do not believe any one of us had any thought of being antagonistic to the Prohibition party. We were banded together with Jesus Christ as our leader, ready to do any thing, work anywhere or in any way, for upholding temperance and righteousness. At every meeting I have attended, some of our very best speakers were from the Prohibition party, as, in fact, they were from all parties. If there are any among our number who did not feel toward the Prohibition party that "we be brethren," working toward one common end, I certainly did not know it. May be I am dull in not being able to comprehend even *now* why these two great temperance parties can not work in harmony. Of course, it has been explained to me ; but still I insist that, while Christ Jesus is our common Lord and Savior, there need be be no clashing unless *Satan himself* gets into our hearts ; and this, I am afraid, he has done. My good brother J. J. Ashenhurst, editor of *The Cornerstone*, Columbus, O., said to me in Chicago (and since by letter) that he personally was willing to do any thing to bring about a union of the Anti-saloon League and Prohibition party. If all were like him I am sure it would come quickly. Now, dear friends, I have pondered long and prayed earnestly that the Holy Spirit would direct me, and tell me if it is wise to bring this much of politics into our journal.

The convention was held in the great armory building on Michigan Avenue. I am told it is capable of seating ten thousand people. I got in pretty early, hoping to get a seat near the speaker, as of late I am troubled to hear unless I can be near by. In fact, at church my seat is almost as near the pulpit as it well can be I can not keep in touch with the speaker unless I am close by. Well, to my surprise and astonishment, at this great meeting the delegates alone filled an inclosure around the speaker so large that I could scarcely catch a word of any of the addresses. There seemed to be delegates from every State, each one carrying an appropriate banner ; and if the sight of the faces of our Ohio delegates gave me a thrill of joy, the whole United States of America, each State furnishing a good-sized crowd of pure *clean* men and women, thrilled me still more. There was so much enthusiasm and cheering I did not expect to hear any thing until the meeting was really opened In a little time I was convinced that humanity needs educating in other lines as well as temperance. The chairman rapped on the table with a good-sized mallet or gavel fully fifteen minutes before he could even make himself heard tolerably. I took into consideration that hundreds of people were meeting there after a long absence ; and I tried to consider, too, that there was an unusual amount of brotherly feeling in that crowd ; but where people have come clear from the western side of the continent to

transact business of the greatest and *gravest* importance, they should be taught in some way to hold their tongues at the proper time. It was not only the women, but the men as well, all over that great audience that *would* visit during the exercises, in spite of any thing the speaker or any one else could do. Please do not think I mean to censure this crowd more than other similar crowds. Our people here in Medina have tried to have speeches on our public square; but it is almost always more or less a failure, just because so many will occupy the seats and crowd within hearing distance about the speaker, and then spend their time in visiting, and talking about private affairs. I do not know but I am somewhat guilty, because during such a meeting sometimes somebody will ask me a question of much importance to him, and he might think me unkind if I refused to give him a civil answer; and this answer calls for something else, and so on, until we discover people around us, and may be the speaker himself, are wishing as vehemently that we too (*two*) would "shut up," as I wished people might shut up at that great temperance meeting. Permit me to add that the interruptions were all of the most friendly and kindly nature. I have *heard* of political meetings where they not only had hard *words*, but fights and brawls to interrupt the speaker.

Well, I spent one forenoon in doing my very best to hear something that some one of the many speakers had to say; but the crowd increased instead of diminishing, and the ventilation was by no means adequate for one of my temperament, so I went away disappointed. Yes, I know very well that Bro. Ashenhurst and other kind friends who knew me would gladly have given me a place where I could hear; but I should have to crowd somebody else out, and I was an Anti saloon man rather than a Prohibitionist. Of course, an invitation was given me to be one of them, and to put on the harness and pull with the rest; but while I am heart and soul in the work they are trying to do, for the reason given above I could not accept the kind invitation.

After having a very pleasant visit with Bro. York, of the *American Bee Journal*, I started for Marengo; and while waiting for the train I looked over the markets of Chicago. Garden stuff and vegetables of every sort (let alone fruit from all over the world) were piled up there in such great quantities I could hardly believe all this perishable stuff could be distributed and used before it would spoil, even by the great city of Chicago. For the first time in my life I saw stalks of rhubarb fully a yard long, some of them almost the size of a child's wrist, stacked up like cordwood. Other vegetables of like luxuriance were there. I should really like to see the grounds where much of this stuff is grown. There were strawberries and raspberries, gooseberries, currants, ripe apples from further south, plums and cherries from California, besides all sorts of tropical fruits. There were cherries as large as plums, and there were plums as large as peaches, until I could not tell whether the crates contained small peaches or large plums. Of course, strawberries were toward the close of the season; and although I looked the market over pretty carefully, I did not find any thing that would compare with some I saw a few hours later, grown on Dr. Miller's own premises. I called at Burnett's, and inquired about honey, but no new honey was yet in the market — at least I did not find it; and, by the way, I suppose it is not so much of an object to get the first honey on the market as it is the first strawberries and the first fruits and vegetables.

I found our jovial friend Dr. Miller dressed in white, not quite like the porter in a Pullman car, but more like a mason or a man who follows whitewashing for a living. I did not catch on to the doctor's reasons for wearing white pants until he reminded me of the fact that bees are less likely to sting a white object than a black one, and I think he is right. If your bees are in the habit of stinging through your woolen clothing, put on some starched linen, pretty good thickness, and I think the bees will go for somebody else dressed in black.

The doctor knew, of course, that I was more interested in looking over the strawberries than the hives, so he took me to the strawberry-patch first. I believe his ground is naturally favorable for berry-growing, but for years past it has been a good deal neglected — that is, so far as I know. (I hope the doctor will take no offense at this.) But on the 26th day of June there was the finest lot of strawberries and strawberry-plants there I ever saw in my life. I do not mean to say by this there were more *berries* than I ever saw before on a like area, for it was at the close of the berry season; but they were the finest and strongest and healthiest-looking plants I ever saw, and quite a good supply of nicer berries than I had been able to find in the Chicago markets during that same afternoon. Now, the doctor did not grow these berries. He is a bee-man and not a berry-man; but Mr. Stull, who married Mrs. Miller's sister, has been growing berries under high pressure. As nearly as I could learn, there are two special points he observes. First, his matted rows are thinned out. I do not think he allows his plants nearer each other than six or eight inches. This thinning is done thoroughly, no matter what it costs. Then he is a crank on the subject of stable manure. In Marengo he gets all the stable manure he can draw, for 25 cents a load. With good roads and an appropriate wagon, and a stout team, I think he said he has piled on as much as two tons at a load. You see the principal part of the expense is the hauling. Well, he goes to work and makes his berry-patch a veritable barnyard, not only between the rows, but between the plants. The ground is black and damp with old well-rotted stable manure. Of course, he gets weed seeds more or less, and this is the greatest objection to his method. He asked my advice about using chemicals instead of manure. I told him I did not think any chemicals would ever grow such berries. They are so large, luscious, and juicy, that I did not recognize many of

my old friends. If I am correct, his best early berry is the Excelsior; and we found a few nice berries still while I was there. The Excelsior is two or three days earlier than any thing else. For an all-purpose berry he would place the Marshall almost if not quite at the head, and I believe I agree with him. He has found the Clyde also to be one of the best. He has no rust on his grounds. I think I never before saw a patch of strawberries where you could find scarcely a rusty leaf on any variety toward the close of the season.

Now, he has been doing with raspberries almost as wonderful things as with strawberries. The Eureka is one of his best black caps. They are cultivated and thinned like the strawberries, and then mulched with manure. He has lately been trying a mulch of some sort of swamp grass that contains no seeds. I think I never saw so many raspberries on the same area of ground—no, not even at our experiment stations. If I am correct, he gets rid of many of the weed seeds in the stable manure by composting it. It is piled on a piece of vacant ground, three or four feet deep, the top of the heap being nearly flat and level. Then at different times the pile is cut down and forked over so as to get it uniform. Sun and rain do the rest of it. There may be some waste by this process—doubtless there is; but well-rotted manure will take right hold at once and make the plants boom. It was worth to me going many hundred miles just to get a glimpse of what is really possible in berry culture by following up these two things: Spacing the plants properly, and piling on the manure in season and out of season.

The doctor and I are both dyspeptics—that is, we have suffered from bad digestion. We both abstained from berries the evening of my arrival; but in the morning, finding myself apparently "O. K." I ate berries before breakfast, then I ate a lot at breakfast (great luscious whoppers), then I sampled them after breakfast again; and after Mr. Stull, the proprietor, had arrived, discovering that I had made a mistake in naming some of them, he and I went over the patches together, and I sampled them still again. Then at dinner I had *another* great big dishful; but when the doctor's wife brought out some beautiful raspberry pie I thought it was time to draw the line, and asked to be excused from taking any pie; but ever so many times since then, when I think how delicious that raspberry pie looked I have almost felt sorry that I did not have a piece and take the chances. By the way, doctor, don't you think you could manage to send me a piece of raspberry pie by express—that is, if raspberries still hold out? I seldom eat pie here at home; but if it was like what I saw that day in Marengo, I think it would not hurt me.

Well, then, there is another thing that is nice at Dr. Miller's. While in Chicago, finding it difficult to get hot water between meals I drank tea and sometimes coffee; but while we were waiting for the train at West Chicago the engineer of the waterworks forgot himself and let the water run over the tall waterworks reservoir; thereupon the station agent opened the valve at the drinking-fountain to take advantage of the situation to rinse the pipes thoroughly. The sight of the beautiful gushing water made me more thirsty. I told the clerk of the eating-room that I would willingly give him the price of a cup of coffee for some of that water made hot. He soon brought it; and, oh it was *so much* nicer than any tea or coffee I ever tasted in my life! It was hard water, but the minerals seemed to me to "hit the spot" and fill a "long-felt want." When I got to Dr. Miller's I was delighted to find the water from his well seemed to be just like it, so I generously treated the crowd (the whole lot) to all the pure clean hot water they all wanted to drink; and may be that is why so many berries did not hurt me a particle. Since returning home I have been longing for more of the water that comes from Dr. Miller's well.

Perhaps I should explain that the hot water I drink is heated to only 110 or 120—never hotter than the latter, and sometimes it is less than 110. Several times, when I could not get artificial heat, I have used water that stood in the sun until it was as hot as the sun would make it. If you find disagreeable symptons follow from drinking all the cold water you want on a hot day, just try water warmed to the above temperatures. Do not by any means think of drinking water so hot that it throws you into a perspiration. This would be very apt to make you take cold, even during a very warm day.

SWEET CLOVER FOR HORSES.

Dr. Miller had just cut two tons of sweet-clover hay. I should say by the looks of it it was allowed to get rather too rank and tall to make the best hay; but as an object-lesson he opened the stable-door and whistled for his three horses. They evidently supposed it was feeding time, or for some special reason they were to be fed. All three marched into the barn, and turned their heads toward the mangers; but as nobody seemed to hinder them they marched over to the hay-mow and pitched into the sweet-clover hay. They first pick off the leaves and small twigs; but after they have trimmed off the stalks and can't get any more they eat up this dry brush, as it were. The doctor suggested something I never heard before—that, although the horses would eat the green growing clover with avidity, they *preferred* the cured hay; so he led one of them out in the yard and gave him a taste of some rank but tender shoots. Of course, he grabbed for this, but soon showed his preference for the cured hay in the barn.

Just now it occurs to me that M. M. Baldridge said *sheep* were exceedingly fond of sweet clover; and, by the way, we are just making a test of using sheep according to Vernon Burt's plan, to keep the apiary slicked up from grass and weeds, making sheep take the place of a lawn-mower. We have fenced off a part of our apiary with wire netting, and a ewe and her lamb occupy the inclosure. About the first thing the lamb did was to pick out all the sweet clover in the inclosure. Then it reached over the low fence for all that could be secured outside; and when the leaves and

small brush were gone it began to devour the larger branches. I have seen so many cases of this kind I should like to see some cattle, horses, or sheep that can not be taught to eat sweet clover.

BASSWOODS; HOW LONG DOES IT TAKE TO GROW THEM SO AS TO YIELD HONEY?

Dr. Miller has a row of basswoods along his lane leading to the house. There are perhaps fifteen or twenty of them. They were loaded with bloom, and were roaring with bees at the time of my visit. Basswoods are not found in his locality unless they are planted; but they seem to grow just as well as here in Medina. I think his trees were planted fifteen or twenty years ago. One near the window where I write, planted 20 years ago, is now over a foot in diameter, and perhaps 40 feet high.

After a visit of less than 24 hours I took the train back to a station opposite St. Charles, then had a very enjoyable ride along the Fox River for eight miles, and in due time I was welcomed at friend Pike's pretty little home with his string of greenhouses back of the house. I wondered some why a florist who kept no bees was taking GLEANINGS and was so anxious to have me pay him a visit. Our veteran readers, especially those who took the *American Bee Journal* back in the time of Samuel Wagner, will remember the name of M. M. Baldridge, St. Charles, Ill. He is now an old gray-headed veteran, and has a very pretty apiary containing a limited number of hives, near friend Pike's. Well, a good many years ago friend Baldridge loaned his neighbor Pike (then a boy) some copies of GLEANINGS, and he read about my high-pressure gardening. When I published my book, "What to Do," he procured it and studied it over and over until he says he can tell what is on almost every page in the book, even now. While we were talking, a customer wanted something from the greenhouse; and in his absence his good wife confided to me that he used to bring the book along with him in his courting days, and insist that she listen while he read aloud some of A. I. R.'s choicest passages about what could be done with plants under glass and otherwise. It was this book that gave friend Pike a start in greenhouse work; and now one of his best customers is Vaughn's great establishment, of Chicago. Friend Pike grows vegetable-plants as well as flowers. I was pleased to see his boys at work on the plant-beds at the time of my arrival, with some cotton sheeting stretched over their heads. This, I believe, is for the double purpose of protecting the boys and the plants themselves from the fierce rays of the sun. Friend Pike has five pretty children. The older ones are already experts in making things grow; but he finds that the price of success is in being constantly on hand, and to be ready to stop in the middle of a breakfast or dinner to wait on a customer, if need be. One of his great specialties is rooted cuttings, as many of our readers kmow. Usually he is able to fill all orders promptly; but, once this season he had an order far beyond his ability, so he got another florist to help him out on it. Very soon a letter came from his customer something like this:

Friend Pike:—The greater part of your shipment was just as it always has been, and every thing grew almost without a failure; but there was one lot of cuttings that were long-legged, and had very poor roots—nothing like what you have always sent before, and these were just about a total failure. Did you grow these poor things, or did somebody else help you to fill the order?

You see he has built up a reputation by years of hard work and practical experience. His most successful greenhouses are built with the short span to the south on the plan advocated by Thomas Slack, on page 185 of this journal, current volume. His houses are warmed by hot water run in cast-iron pipes put together with cement. The greenhouses and the home slope toward the street, and on the street is an electric carline. When I wrote that book, "What to Do," I recommended that your gardens should be adjoining a public road, so that their attractive appearance would induce every one who passed by to stop and look, even if he did not make a purchase. I did not think of adding that an electric carline would be better. In fact, they were not as common at that time as they are now.

In the evening friend Baldridge came over, and another bee-keeper who lived near, and we talked bees, sweet clover, etc., and finally the different political parties, until it was pretty close to midnight. I had a good nap after my wheelride, so I had the advantage of the rest in the way of sitting up. Well, I suppose I shall not be telling stories out of school if I say that our old friend Baldridge, and Mr. Pike also, are *Democrats*. The fourth one of our party was a pretty strong Republican, and we had an exceedingly friendly discussion. As I knelt down before retiring I thanked God for having given me a better view of our Democratic brethren and what they are trying to do; and it seemed to me, too, that I caught a glimpse of a good time coming when Democrats and Republicans—yes, and Populists and Prohibitionists—shall meet together, and not only say, but feel from the bottom of their hearts, "We be brethren." Of course, my two friends are pronounced temperance men, even if they are Democrats. Now, please do not feel hurt, anybody, when I say this: My education and bringing-up among Republicans has, perhaps, led me to fall in with the Republican idea that Democrats are *not* specially temperance people. I do not feel that way now, mind you. My two friends said they lamented, as much as anybody else, that the Democrats seemed to fear to say any thing or do any thing for temperance, because, like the Republicans, it might "hurt the party." Here is something I just clipped from the *Ohio Farmer:*

Soon the political campaign will be opened, and we shall hear it from the stump and read it in our political journals, that unless "our ticket" is elected the country will be totally ruined. Don't believe it for a moment. The country is not going to be ruined by the election of either ticket.

The truth is, we have good pure clean men in all our parties, and enough of them, to save our nation; but they are all handicapped, and, I might almost say, fettered hand and foot, by

the present unfortunate state of affairs; or perhaps I might put it another way and say by millionaire brewers and distillers. God helping us, deliverance is coming.

On the morning of the second day we took a wheelride down the river to Geneva. When I first heard the words "Geneva, Ill," I kept saying them over to myself, wondering what bee-keeper lived there. Finally I thought of our veteran friend George Thompson, who has been an old standby at our conventions for years past; so friend Pike and I took a wheelride down the river. Friend Thompson was down in his garden amid the shrubbery on the river-bank, working with his bees; in fact, he was just taking off his first filled and capped sections of honey. When I stood before him and burst out laughing to see his astonishment (for he had had no notice of my coming) he put down his tools, and, after shaking hands, gave me, I think, the warmest reception I ever received in any of my travels. He put both arms around me, and gave me such a hug I did not know but he was going to smash me up, bear fashion. After our wheelride we were naturally a little thirsty; and while he went to his cupboard he shook his finger at me playfully, saying, "There, there! you need not be afraid, Bro. Root. I shall offer you nothing to drink that will trouble your conscience." I have since wondered how it was that a pitcher of lemonade happened to be just there at that time; but it hit the spot exactly, and I don't know but I shall have to take back a little what I have said about hot water. There are times and circumstances during a hot summer day when lemonade seems to fill a "long-felt want" as nothing else does in the world. Bro. Thompson is a stanch Republican, and I was glad to hear him tell of our President's many good qualities. He lamented, like the rest of us, the canteen disgrace, but ventured to say that the President may have had difficulties in the way of doing as he wanted to that we knew nothing about. However, when I finally told him I might, perhaps, overlook it all if it were not that culminating point where he tried to make the delegation of women from the W. C. T. U. believe that he *supposed* the temperance people intended by their law that the canteen business should *keep right on*, friend Thompson was honest enough, *then* and *there*, to admit, as every Republican or anybody else should admit, there is a time when forbearance ceases to be a virtue.

In order to strike Vaughn's greenhouses I took the train again next day for a station named Maywood. From there I was to wheel it across the country eight or ten miles, as nearly as we could guess by looking on the map, to see Vaughn's greenhouses, about fifteen miles out of Chicago. My ticket was purchased, and my wheel checked for Maywood; but when we got to Geneva we were informed that all should change cars. I saw a man taking my wheel from the baggage-car, and told him to be sure to get it on the train that was just ready to start. He looked at me as if he thought I was meddling; but, notwithstanding my suggestion, when the train began to move he was just picking the wheel up from his truck to put it in the baggage-car, and, to my dismay, off went the train, leaving him on the platform with the wheel in his hands. This was about noon. The conductor told me I would have to wait at Maywood till 5 o'clock to get my wheel; and as this would knock out the whole afternoon, and prevent my visiting Vaughn's greenhouses, I remonstrated somewhat. He replied he could not wait all day for any baggage-man with such slow motions as that fellow. Now, I was not angry at all, but I remonstrated because the conductor could not hold the train long enough to set the wheel in the car. Finally he got very red in the face, and talked pretty roughly. At this juncture I concluded that what could not be cured would have to be endured; and, to tell the truth, one of my favorite passages of scripture began to push its way into my mind, especially that part of it which says, "Pray for them for which despitefully use you and persecute you." I did not expect my prayer to be answered; in fact, I am ashamed to say I hardly ever do, even when I follow the dear Savior's directions as I did then. I stopped so abruptly, and took it so meekly, the conductor must have been a little surprised, for he came back after a little while and sat down beside me and said he was mistaken in saying I would have to wait till 5 o'clock to get my wheel. Said he, "This train does not stop at Maywood, but the next one does. You get off at the next station, wait for the train after this, and you will find your wheel on that train, and reach Maywood a little after 2 o'clock.

In due time the train brought up at the station where I was waiting; and after catching a glimpse of my wheel in the baggage car I jumped aboard with a light heart. Imagine my consternation, however, to see a fellow standing on the platform with *my wheel* about as soon as the train had got under fair headway. I called to him that *that* wheel was to be put on that train. He replied he had orders to take it off, and I was in a stew again. In fact, I meditated jumping off the train while it was under pretty good motion, for I could not be happy just then and there without that wheel. Pretty soon I became settled again, and tried to think of some more scripture texts to fit the occasion. Then the conductor came along and informed me that *that* train did not stop at Maywood either—that I would have to get off at the next station and wait for a train later, where I would find my wheel. Now, the above little incident illustrates several things. First, the great railroads that run in and out of Chicago like the spokes of a wheel are running trains one after the other every few minutes. Some stop at the little stations, and some do not. Another truth is, at least *some* of the railroad men know what they are doing, even if one conductor should not; and if I had kept my check in my pocket, and simply obeyed orders, without getting into a fret, my wheel and myself would both have been landed at Maywood a little after 2 o'clock, just as the agent told me who sold me the ticket. When I got on the platform at

Maywood, and got hold of my trusty wheel once more, I felt like—well, say like a little girl who has lost her doll baby, and recovered it after several trying experiences. We are, all of us, but children of an older growth, any way.

The first person I met in Maywood was a boy of about sixteen or eighteen, smoking a cigarette, and holding a wheel by his side.

Said I:

"My young friend, I see you ride a wheel. Perhaps you can tell me how far it is to Western Springs."

He replied that he never heard of such a place.

"Why, Western Springs is where Vaughn the great florist has so many greenhouses. Surely there is such a place near here."

Again he replied that he never heard of Vaughn nor of any greenhouses.

"Well, then, will you please direct me to a bicycle repair shop? They will probably know all about it."

He replied he did not know of any place where they repaired bicycles.

"Oh! then you do not live in town?"

He replied that he had lived there all his life. I do not know but I got a little stirred up again. Said I:

"You say you have lived here all your life, and you ride a wheel, and yet do not know whether there is a repair shop in town or not."

He still declared he did not. Now, I relate this incident to show you what kind of fruit cigarette-smoking produces, or what sort of *young men* it produces, if you choose. I found a repair shop right in sight, and they told me Western Springs was off south somewhere, about seven or eight miles; so I followed the street-car line off south. Nobody knew much about Western Springs; but a traveling notion-dealer said I must turn and go east about a mile, when I would come to a saloon, and then turn south again, and he thought at this saloon they could tell me more about it. Now, this street-car line ran out to a sort of beer-garden where there were any number of saloons; but there did not seem to be a man or woman in the saloons or out who ever heard of Western Springs. I inquired of people on the street and of people inside, but they all seemed to be soaked in beer everywhere. At one place I found a gray-haired woman, the only occupant of a saloon. She sat near a table, with a pitcher of beer. She did not know any thing about such a place—never heard of Vaughn nor of any greenhouses. A man with a bloated red face came in, and he did not know any more. The woman who kept the bar said she thought she had heard of such a place somewhere. I tried saloon-keepers and other people with the same results. Finally, in sheer disgust, my wheel and I started off south, without instruction. I found a market-gardener loading up cabbages. *He* was in his "right mind," and had some sort of head-piece on top of him. He explained to me that Western Springs was only eight or ten miles from Maywood, but that I should have to go a good deal further to get there, on account of the river.

I have given you a pretty sad description of the inhabitants in the suburbs of Maywood. Permit me to add, however, that they have most beautiful roads along the street-car lines and past the saloons. Perhaps the beer business built the beautiful roads. When I came near a town called Riverside things looked better, and I fell to wondering whether the people of Illinois knew there is a place so beautiful as Riverside. It is all green lawns and asphalt streets. There are no fences, no weeds — nothing but handsome residences, lawns, flowers, and parks. I was in a hurry or I would have explored a little more. When I crossed the river the saloons and bloated faces were in evidence again, and nobody knew of any thing. When I neared Western Springs I passed through a town the name of which I forget, with most beautiful graded streets planted with trees, and every thing in regular suburban style, all but the *houses*. I felt amply repaid for all my trouble and pains that afternoon when I got a glimpse of Vaughn's great string of greenhouses, some time between four and five o'clock. But I shall have to defer, till the next issue, an account of my visit there.

THE STARVING ONES IN INDIA.

A Report on the Spot, from a Missionary who Takes Gleanings.

My dear Mr. Root:—For the last four months I have been going to write to you, but I have been too busy in famine-relief work; but, time or no time, I must write you. I received your paper for several months, which I was glad to get. I received your letter also; but since receiving it I have been transferred from Kaira to Sanand, which is a new station opened by our mission.

To take the cattle as a whole, ninety per cent of them are dead, if not more. There are very few wells in this district, hence very little irrigation. The small irrigated barley harvest which has just been reaped has been a costly one to hundreds. Many have spent 50 rupees (a rupee is equal to 33 cents), others more, in raising their crops, only to get about 15 rupees in return. This was owing to the very cold weather experienced here this last cold season. So not only has the monsoon crop failed, but the cold-season crop also. Gouari, a medium-sized white grain, is usually sown at the beginning of the hot season; but very few have in this district ventured so soon, being afraid, undoubtedly, that it would be labor in vain, on account of the dryness of the land and the weakness of their cattle. You will see from the above that there is no hope of getting any food stuff from within until next October; and until then all food stuff must come from without.

The people who have thus far stayed in their villages to try to raise a small crop have sold and pawned every thing to buy food with. Many of them are now pulling the doors out of their houses, also the tiles and beams off the roof, and are selling them for food; and in going round from village to village one of the saddest sights one sees is some of the women and young girls almost nude, and some quite. I know of whole families of from five to eight in number from whose clothes, taking them all together, one could not get a yard of good cloth. I have had one case brought to my notice where the poor woman could not leave her house. I have seen others who have had to wear their bedding around themselves during the day. Mothers, being half starved themselves, have no nourishing food for their suckling babes; hence the children are seen by the score dying at their mothers' breast. These mothers, with tears and sorrow, implore us on behalf of their little ones. Truly it is Matthew 2:18 over again, only instead of the little ones being killed by a cruel king a cruel famine is taking them off. "In Rama was there a voice heard, lamentation and weeping, and great mourning, Rachel weeping for her children, and would not be comfort-

ed because they were not." Oh the young children that we see dying every day! Here they are, mothers and fathers around us the whole of the day, nothing but skin and bone, pleading piteously for food. Only when we lay our heads on our pillows at night are we free from these heartrending sights, and sometimes not even then, for the sights and sounds of the day often appear again in our dreams. I do not write of those people found in the bazaar every day, but of bona-fide villagers. I have already seen several human beings being eaten up by dogs and birds; in fact, this sight is of almost daily occurrence; and finding dead bodies lying by the wayside is quite common. These poor creatures sit down by the wayside to rest; but, being too weak to raise themselves, this is their end. We have a burning pile kept going day and night. Usually six bodies are burned together; and as days go by it will get worse. One of the most conspicuous places in each village is the spot allotted for the burning pile.

We are at present giving relief in the following ways:

Selling maize at a very cheap rate, 5 pounds for 3 annas, or one pound for 1¼ cents We are selling daily from 200 to 320 lbs. Some of the people are coming a distance of 20 miles to buy; and, so far as I can judge, this is one of the best forms of famine relief.

In my visits to the vil ages I take a small quantity of rice with me on the camel or in the cart; visit from house to house, find out the sick and very needy ones, give them a ticket and enough rice to feed them until the next day, when they come into Sanand and present their ticket to Mrs. King, who gives them a supply for two or three days, according to the distance of the village. This is entered in a record-book, and at the end of the second or third day they get another supply, just enough to keep life in them. Widows and fatherless children are treated in this way.

Let me describe to you some of the sights found in these visits. I usually go to the chief man of the village, who is responsible to the government for the peace of the village, but who is himself, for his greed of filthy lucre, the greatest peace-breaker. Having asked him how things are in his village the answer generally is, "As the year is, so the people are," which is perfectly true; for a year of famine means a famished people. My notice is drawn to a family of the potter caste, who had, a day or two before, given up all hopes of pulling through. I found them, five in number, all shut up in their house. Only one was able to stand. Food was at once given to them. A day or two after, the father died; the mother will go, for the poor creature has been without food too long for one to do much for her; two of the children are doing fairly well.

Visit No. 2 found the father lying on a cot, burning with fever, with three little motherless children sitting by the side of it. This man was the owner of 40 head of cattle. Every one has died of starvation. The poor mother also went the same way about six weeks ago. There sat the three poor little bony creatures slowly but surely going the way of their mother—no food.

Visit No. 3 finds a widow with five children. It is impossible f r three of the five to live. A girl of 14 put her hands together and looked up piteously into my face as I bent over her cot, and pleaded for food, which was quickly given.

Visit No. 4 found a widow and her two children sick with fever—had had no food for two days.

Visit No. 5, again a poor widow with two sons. The sight of the poor creature turns one faint. She had gathered and sold wood to support her children. Her strength has run out, and here she lies, I fear, never to rise again.

The above is only an outline of thousands of cases in the surrounding villages.

If you feel led to publish this letter you may do so. I leave it with you; but may God never allow me to see another famine. Here we have to live and have our being in the midst of it, so we know the awfulness of it. Mr. Root, it is impossible to draw a picture too dark. I shall send you a few photos as soon as I can get them. T. F. KING.

Sanand, Gujarat, India.

On receipt of the above letter I decided at once to send a check for $100, and Ernest for $25. This $125 was sent directly to Rev. T. F. King; the remainder, $8 00, was sent to Frank H. Wiggin, as heretofore. Lest some of the friends be discouraged, and conclude there is no help for the things described, permit me to add that we have good authority for stating there is no more fertile soil in the world than that of India. In other words, an acre of ground there, with proper facilities for irrigation, will keep as many people from starving as an acre almost anywhere else in the world. All that is needed is to construct reservoirs, and go to work exactly as we are now managing the Great American Desert; and work of this kind is already in progress on a large scale, the people being paid sufficient wages to keep them alive while the reservoirs and irrigating canals are in process of construction. The responsibility of putting an end to such suffering rests directly on the shoulders of each one of us. Dear brother or sister, whenever you waste a particle of food, or pay out money for things you can well get along without, for God's sake remember the starving brothers and sisters in India, as described above, and lend a helping hand with whatever amount you can spare.

INDIA RELIEF FUND.

A. I. Root, Medina, Ohio	$100 00
E. R. Root, " "	25 00
Mrs. Warner, " "	1 00
Henry Zeiner, Bertig, Ark	1 00
Harriett Herr, Williamsville, N. Y.	4 00
Esther Herr, " "	1 00
John S. Snearly, " "	1 00
	$133 00